AMERICAN · HOME · ECONOMICS · ASSOCIATION

FROM CLASSROOM TO KITCHEN WITH CARNATION MILK

SUBJECT No. 6-A

Why Does Carnation Milk Make Better Custard?

CARNATION CUSTARD

(Makes 6 medium custards)

4 eggs
½ cup granulated sugar
½ teaspoon salt
1 teaspoon vanilla
1⅔ cups (1 large can) undiluted Carnation Milk
⅔ cup water

1. Combine all ingredients in medium bowl. Beat until well blended. Pour into individual custard cups.

2. Place custard cups in pan of water. Bake in moderate oven (350° F.) 40-45 minutes. Remove from water; cool.

3. Serve in custard cups or dessert dishes. Delicious plain or topped with sliced fruit or chocolate sauce.

Custard should be judged on texture, color and flavor. Carnation has characteristics not found in other forms of milk that improve all three of these qualities. The extra richness of Carnation, when mixed in two-to-one proportion with water, results in a firmer, creamier-textured custard, with a richer flavor and more tempting color. Carnation, unlike other forms of milk is specially *heat-refined,* too. This results in a smoother custard and further enhances its flavor.

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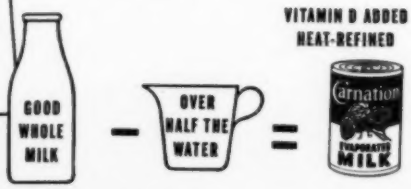

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SEA FOOD BISQUE

1 5- or 7-oz. can shrimp*
2 tablespoons chopped onion
2 tablespoons chopped celery
1 small carrot, grated
2 tablespoons butter or margarine
3 tablespoons flour
4 cups milk**
½ teaspoon salt
Dash of pepper
1 bay leaf
Chopped parsley

Devein and split shrimp or cut in quarters. Add onion, celery and carrot to melted butter or margarine in a 2-quart saucepan. Cook slowly, stirring occasionally, until vegetables are soft. Remove from heat and blend in flour. Gradually stir in milk. Return saucepan to heat and stir constantly until mixture is smooth and slightly thickened. Add seasonings, bay leaf and shrimp. Simmer 15 minutes. Remove bay leaf and serve bisque at once. Sprinkle chopped parsley over top, if desired. *5 Servings.*

*A 7¾-oz. can salmon, 7-oz. can tuna, 6½-oz. can crab meat or 6-oz. can lobster may be substituted.

**Diluted evaporated milk may be substituted.

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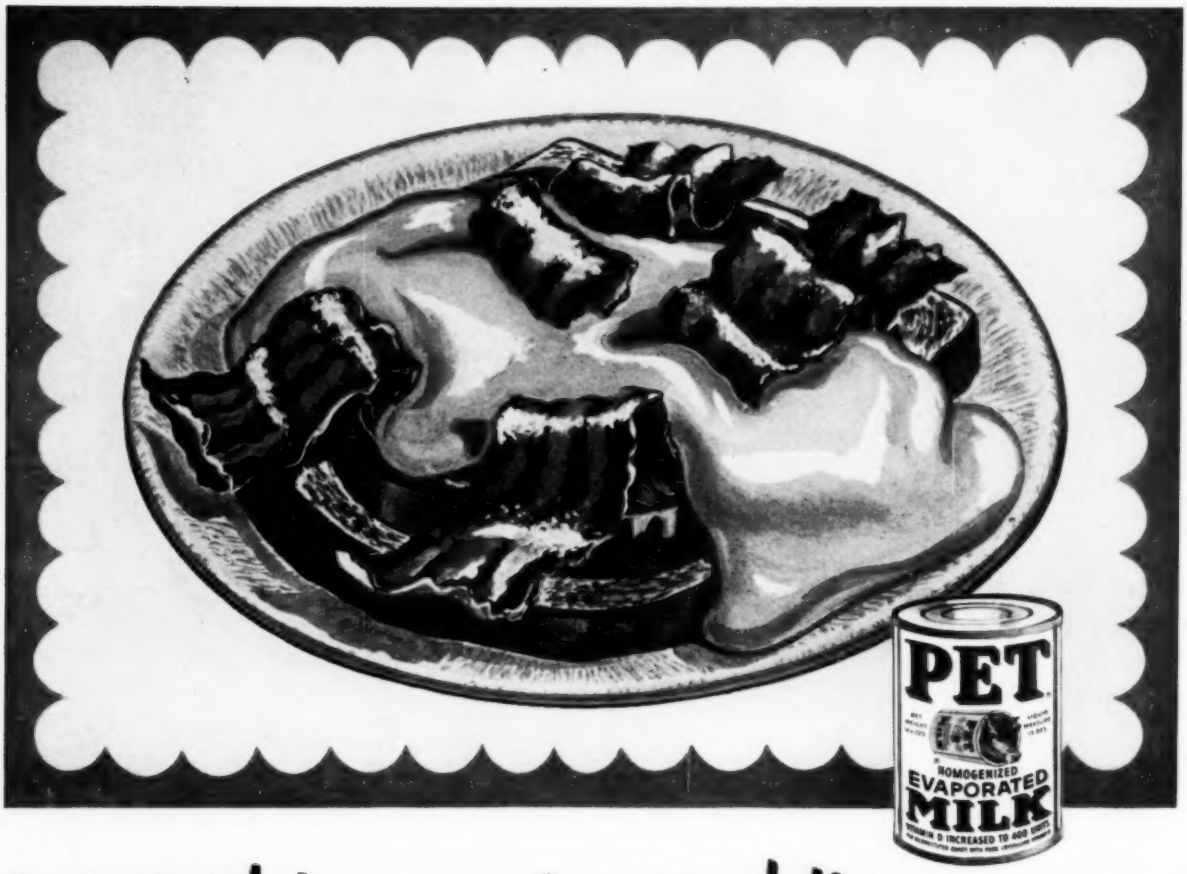

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JOURNAL OF *Home Economics*

OFFICIAL ORGAN OF THE AMERICAN HOME ECONOMICS ASSOCIATION

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Constituents	Fresh Fruit, peeled	Strained Juice	Constituents	Fresh Fruit, peeled	Strained Juice
Calories	46	46	Inositol	400.0 mg.	200.0 mg.
Protein (including free amino acids*)[1,4]	1.0 Gm.	0.9 Gm.	Biotin	0.004 mg.	0.002 mg.
Fat	0.3 Gm.	0.2 Gm.	Folic acid	0.004 mg.	0.002 mg.
Dextrose and Levulose	4.0 Gm.	4.6 Gm.	Ascorbic acid (vitamin C)	60.0 mg.	57.0 mg.
Sucrose	4.0 Gm.	4.6 Gm.	Flavonoids (vitamin "P")[3]	1.0 Gm.	0.1 Gm.
Protopectins and Pectin	1.0 Gm.[2]	0.1 Gm.	Minerals (total ash)	0.5 Gm.	0.4 Gm.
Citric acid	1.0 Gm.	1.0 Gm.	Calcium	50.0 mg.	11.6 mg.
Malic acid	0.1 Gm.	0.1 Gm.	Phosphorus	30.0 mg.	20.0 mg.
Carotenes (pro-vitamin A)	1.0 mg.	0.16 mg.	Iron	1.0 mg.	0.25 mg.
Thiamine (vitamin B_1)	0.2 mg.	0.086 mg.	Sodium	9.0 mg.	6.0 mg.
Riboflavin	0.1 mg.	0.032 mg.	Potassium	150.0 mg.	170.0 mg.
Niacin	0.5 mg.	0.24 mg.	Magnesium	10.0 mg.	13.0 mg.
Pantothenic acid	0.5 mg.	0.21 mg.	Sulfur	10.0 mg.	8.0 mg.
Pyridoxine	0.2 mg.	0.08 mg.	Chlorine	6.0 mg.	6.0 mg.
			Alkalinity of ash, expressed as K_2CO_3	0.3 Gm.	0.3 Gm.

* Free amino acids include alanine, arginine, asparagine, cysteine, serine, proline, and glutamic, aspartic and gamma-aminobutyric acids. Glutathione is also present.

1. Underwood, J. C., and Rockland, L. B.: Food Research, in press.
2. Miner Laboratories, Chicago, Illinois. (1952)
3. Davis, W. B.: Determination of Flavanones in Citrus Fruits, Anal. Chem. 19:476 (July) 1947.
4. Underwood, J. C., and Rockland, L. B.: Arch. Biochem., in press.

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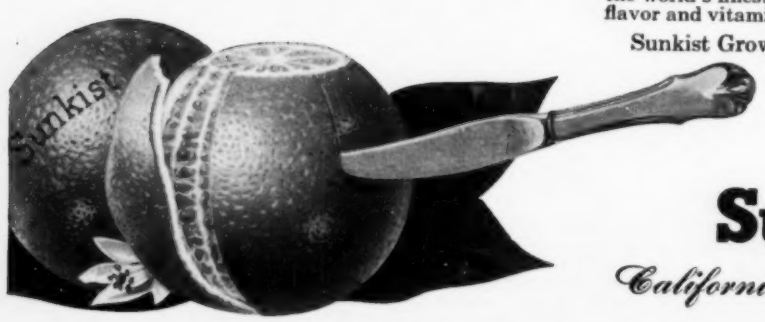

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Washington News

Research Issue

• **The Journal devotes this issue to research in** home economics because we believe that the findings of research are woven into the daily work of every home economist. Some of the findings reported in this issue can become a part of our professional activities as soon as today—others will appear less immediately, perhaps, but with equal importance, in our subject matter and procedures.

The Association is proud of the opportunity to present this research issue and it is proud of the research in home economics reported here. The JOURNAL staff is particularly grateful to Catherine J. Personius for her guest editorial on the opposite page.

AHEA Executive Committee Meets

• **The executive committee** of the American Home Economics Association held its regular midwinter meeting at AHEA headquarters in Washington, January 14, 15, and 16. All members of the committee were present for the meeting.

• **Top billing on the agenda** this year was given to a review of the proposals presented by the special committee appointed to study the place of divisions and departments in the Association. Marjorie M. Heseltine, chairman of the committee, presented a revision of the original proposals. The revision was prepared after study of the reactions received from Association groups and individuals who have discussed the proposals as they were presented at the 1952 annual meeting. The revised report contained a recommendation for further study by Association groups and a recommendation that *final action on the proposals should not be taken this year.*

The executive committee decided that the revised report should be distributed to state associations and other Association groups for further discussion. Copies are also available on request from the Association headquarters. It is hoped that a "Town Meeting" type of program can be planned for the annual meeting to have presentations for and against and to provide opportunity for questions and discussion from the floor.

• **Reporting for the committee on revision of the constitution and bylaws,** Helen Stacey, chairman, discussed with the executive committee the revisions her committee plans to recommend. These do not include any proposals for change in Association organization. Proposed revisions will be published in the June JOURNAL.

• **A recommendation** from the advisory committee on AHEA publications that certain other organizations or institutions be allowed to distribute AHEA materials, particularly career and consumer interest materials, was approved. This means, for example, that schools may purchase quantities of AHEA career leaflets for distribution and may imprint their name on the leaflet.

• **Committees concerned with the furnishing of the AHEA headquarters** building were able to display the newly furnished Ellen H. Richards room and to report plans under way for the kitchen to be installed adjacent to the conference room and for the employees' lunchroom.

The Permanent Headquarters Fund committee reported a number of sizeable contributions received recently.

• **Headquarters** staff members reported that the past year's cost of the maintenance and operation of the headquarters building is only $2,380 more than was the yearly cost of renting the much smaller space in the Victor Building. Included in the year's maintenance was the cost of repainting all outside window frames, doors, and woodwork.

• **Gertrude Chittenden,** representative of the divisions and departments, reported work under way in the preparation of educational materials, plans for the annual meeting program, and public relations activities.

• **On the lighter side,** the Association arranged a social occasion to provide an opportunity for representatives of business and professional organizations and of government agencies to meet the AHEA officers.

VOLUME 45, NUMBER 3, MARCH 1953 JOURNAL OF Home Economics

HOME ECONOMICS RESEARCH

RESEARCH, or the systematic study of a subject to discover new facts and to establish principles and fundamental truths, is a continuing need in every field of learning. It is especially important in a relatively young and dynamic field like home economics. The findings of research have a contribution to make to each of our subject specializations and to each of our professional fields.

The objectives of home economics research are at least threefold: to add to the sum total of knowledge contributing to good homes and the well-being of families; to assess family needs and preferences and interpret them to groups who play a role in meeting these needs; and to use research facilities to train tomorrow's research workers.

The searching out of facts and principles that will contribute to the provision of good homes, to the maintenance of the physical and mental health of family members, and to the development of constructive and pleasant human relationships is the primary purpose of home economics research.

Through home economics research we hope to learn more about how food, clothing, and housing affect health; what factors affect the quality of products that homemakers prepare; what procedures are economical of time, effort, and money; and what are the basic principles for the selection, use, and care of household commodities. This knowledge can aid homemakers in making intelligent and satisfying decisions and choices.

We need likewise to discover the basic principles for the development of normal and wholesome personalities and stable homes. That these principles and these interrelationships are difficult to establish should be a challenge—not a deterrent—to further investigations in the field of human development and relationships.

A second major objective of home economics research is to assess family needs and preferences and to interpret them to those groups in our economy who play a role in meeting these needs. To the extent that we know what will contribute to the well-being of families, we can make an attempt to adjust the production programs of agriculture and industry to meet these needs, as well as to adjust family practices to suit production programs.

Finally, we need to train for tomorrow research workers who will have the vision and the technical competence to carry on the present work and to open new fields of home economics research for the well-being of families.

CATHERINE J. PERSONIUS
Co-ordinator of Home Economics Research
Cornell University

This editorial is taken in part from a talk at the 1952 meeting of the Association of Land-Grant Colleges and Universities.

Kitchen planners, home builders, and householders can add the data from this study to their general information about space and design which will allow for satisfactory working space for one of the important kitchen tasks. Research workers may find this method of studying space requirements applicable to other studies.

Method of Determining Size and Shape Requirements of Work Surface for Preparing Products for Baking[1]

Rachel Rutherford and Maude Pye Hood

Miss Rutherford is an instructor in the School of Home Economics and research assistant in housing in the College Experiment Station at the University of Georgia. Dr. Hood is professor of home economics in the School of Home Economics and home economist in the College Experiment Station at the University of Georgia.

IN the production of livable houses at reasonable cost an important consideration is the relation of storage and work areas to the physical and psychological demands on the worker. There is an increasing realization that work surfaces and storage cabinets should be designed to meet requirements for the activities in which families engage. In undertaking to set up space requirements for work areas in homes of southern farm families, the first step was to establish a method for determining basic space requirements for a specific activity.

Since more than 90 per cent of the farm families interviewed in the southern regional housing survey (*1*) frequently baked biscuits, corn bread, muffins, pies, and cakes, and 63 per cent baked cookies, the work area for the preparation of baked products seemed important in planning kitchens for these homemakers. Hence, this study to determine basic space requirements for work surfaces was begun on the requirements for the specific activity of mixing the baked goods commonly prepared in southern farm homes. Preparation of four products frequently baked by a large number of southern families was used in determining the space needs.

Method

Selection of equipment. The number and size of utensils used in an activity influence the requirements for work surface as well as the accompanying storage space. In order to formulate a list of the utensils needed in the preparation of breads and pastries, preliminary work was done in which a laboratory worker recorded the items and sizes of equipment found by her to be satisfactory in preparing the products under consideration. The products were prepared in quantities to serve four, six, eight, and twelve persons. A check of whether or not families are likely to use this same type of equipment was based on a list of the utensils the families reported they owned in the inventory data of the housing survey (*1*). Any articles on the prepared list which were not reported owned by at least 25 per cent of the families were removed. If another article, similar in use to the one removed, was reported owned by 25 per cent of the families, it was substituted; otherwise, the item was eliminated and the procedure adjusted accordingly.

Standardizing worker's technique. The worker's technique for the mixing processes was developed by repeating each procedure until she had confidence in her skill. Following this, the worker's hand-body activities were recorded by an observer during at least four of the mixing procedures for each product. The record on each procedure was studied in order to improve the technique used in the next repetition. Thus the mixing of each product was repeated until a technique was standardized whereby unnecessary hand and body motions were eliminated, work of both hands was balanced, and suitable arrangements for placing and releasing items on the work surface were indicated.

[1]Paper No. 7, College of Agriculture Experiment Stations, University of Georgia, Athens. Report of a study which is a part of the Southern Regional Housing Project—RMA, S-8.

"Unlimited" work surface. An adjustable laboratory cabinet, 56 inches by 24 inches, was used in the study. This was considered "unlimited" length inasmuch as it provided for the normal arm span of a person of average size working on a surface 36 inches above the floor (2). The cabinet was constructed so that changes could be made in the size, the shape, and the height of the work surface and also in the number, the depth, and the spacing of shelves in wall and base cabinets. This flexibility made it possible to change the size and shape of the work surface as the study progressed.

Space measurements. In order to determine the space actually used during the mixing procedures, the work surface of the laboratory cabinet was marked in 8-inch module squares. Equipment for the mixing process was placed convenient to the worker. Throughout the preparation of each of the four products, an observer charted on squared paper the position and movement of each utensil in relation to the module squares. These operation-process charts showed the number of times each module square was used for each of the series of mixing procedures (figure 1). By adding together the number of times each square was used during one preparation of each of the products the size and shape of the work surface most used for mixing the baked products were indicated.

4	4	7	5	2	2	0
13	20	12	7	4	3	5
7	16	14	9	2	2	3

FIGURE 1. TOTAL NUMBER OF TIMES ITEMS WERE PLACED IN EACH MODULE SQUARE DURING ONE PREPARATION OF COOKIES

(Each module is 8 inches square.)

The next step was to see how the worker would accommodate the procedures when the space was reduced. Systematic reduction of space through the elimination of square areas least used in a process produced several different sizes and shapes of spaces. The standardized preparation of the few products was repeated on each of these different sizes and shapes of work surfaces, and a second reduction of size and choice of shapes was made on the basis of the space most used. The areas of the surfaces used for all four processes seemed to approach three general shapes, rectangular, semicircular, and L-shaped (figure 2).

Testing work areas. The total area utilized for the mixing of each product prepared fell within the total area used in the preparation of rolled cookies. Hence, the preparation of cookies was chosen as

Array of time record data by size and shape of surface area

WORK SURFACE SIZES AND SHAPES IN CHRONOLOGICAL ORDER OF TESTING		TIME REQUIRED FOR ONE PREPARATION DURING REPLICATIONS INDICATED							AVERAGE TIME FOR EACH SURFACE
Shape*	Size	1	2	3	4	5	6	7	
	sq. in.	min.	min.	min.	min.	min.	min.	min.	min.
A	1248	29.5	26.0	28.2	27.5	25.0	25.5	26.5	26.8
C	832	25.5	23.7	25.5	24.7	24.7	25.0	21.7	24.4
B	1040	25.2	23.7	24.5	22.7	23.5	23.2	20.5	23.3
A	768	22.5	23.0	22.2	21.0	24.2	23.0	22.7	22.6
C	1056	25.2	22.0	22.0	21.5	21.0	25.0	20.2	22.7
C	912	21.0	22.5	20.2	19.5	22.0	22.5	23.0	21.5
C	960	23.2	22.5	18.2	23.5	20.5	20.7	23.7	21.7
C	864	20.5	19.5	19.0	18.7	23.5	19.2	19.2	19.9
B	960	20.2	22.2	19.5	21.7	18.7	21.5	21.0	20.6
B	896	17.7	22.0	22.5	22.7	21.5	22.0	21.0	21.3
A	1056	19.7	19.5	22.0	22.2	19.7	18.7	19.2	20.1
A	432	18.0	18.0	23.2	21.0				20.0
A	360	21.2	20.0	20.5	18.7	25.0	19.2	20.0	19.8
B	256	18.0	17.0	17.0	16.5				17.0
Average time for each replication for all surfaces		21.9	21.5	21.7	21.5	21.8	22.0	21.3	

* A = rectangular shape.
B = semicircular shape.
C = L-shape.

Rectangular shape Semicircular shape L-shape

FIGURE 2. THREE GENERAL SHAPES OF THE AREAS FREQUENTLY UTILIZED DURING PREPARATION OF BISCUITS, CORN MUFFINS, PIES, AND COOKIES

(Each module is 8 inches square.)

the device to be used in subsequent tests for evaluating the several sizes and shapes of work surfaces. A series of tests was run on each of 12 differently sized areas. Each of the three general shapes (figure 2) was tested in three or more sizes.

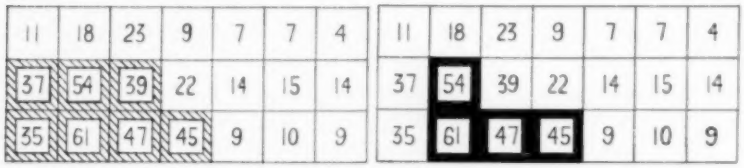


FIGURE 3. SIZE AND SHAPE OF THE WORK AREA BY FREQUENCY OF USE OF MODULES DURING ONE PREPARATION EACH OF THE FOUR PRODUCTS

(Each module is 8 inches square.)

When the size of the available space was diminished to the point that the squares retained were only those used 25 times or more during one preparation of each of the four products, the area approached an L-shape (figure 3).

An L-shaped area of 256 square inches evolved from an analysis of the records which showed the squares that were most frequently used (figure 3). The laboratory worker verbally expressed feelings of frustration when working on this small area. Hence, no areas smaller than this were tested. This minimum area was tested by 18 workers of similar experience and skill in food preparation. The shape of the minimum area used for these tests was a square which is generally considered a convenient shape for construction purposes. Although the workers were able to perform the task, they, too, expressed the feeling that this was an exceedingly small area for a mixing surface.

It was thought that time required to do the job might be used as a relative measure of the desirability of a specific work surface. Hence, records were made of the time required to prepare the cookies throughout the testing of the various sizes and shapes of work surface. A stop watch was used in recording the time at the beginning of the mixing process, at the end of the process, and again at the end of the cleaning-up process.

In the table, the array of data and the accompanying time averages seem to indicate that the chronological order of surfaces tested had more influence on the time required for the process than size of area, shape of space, or individual replications on a particular work area.

This may be interpreted to mean that familiarity with the process had the greater influence on time required for preparation. It may be noted in the table that after 7 work surfaces had been tested 7 times each, the average time for a preparation—on shapes C, 864 square inches (19.9 minutes), through A, 360 square inches (19.8 minutes)—ranged between 19.8 and 21.3 minutes with the exception of the last small area in which only 4 replications were made where the time average dropped to 17.0 minutes.

Due to the exploratory nature of this study, reduction of size of work surface and change of shape of the surfaces was not carried out in an orderly pattern that could be statistically analyzed. In further use of the method, randomization of the order of testing different sizes and shapes used would give more reliable data.

Evaluation of Method

In reporting the method used, it is believed that the procedure may have application in determining surface requirements for other household tasks.

Module squares and operation-process records were useful devices for determining frequency of use of specific areas on work surfaces. By this means the total area needed in performance of a task was determined. At the same time the area shape which lent itself most easily to the task at hand was indicated.

References

1. FARM HOUSING IN THE SOUTH, Southern Cooperative Series Bulletin No. 14, Georgia Agriculture Experiment Station, Experiment, Georgia, 1951.
2. MUNDEL, M. E. *Motion and Time Study*. New York: Prentice-Hall, Inc., 1951.

Building Our Profession

Since we last reported AHEA membership we have doubled the number of states whose membership has exceeded their 1951-52 total. Credit Massachusetts, Mississippi, New Hampshire, Oregon, Rhode Island, and Washington with honor roll status this month.

This account of a co-operative venture in nutrition research will be of special interest to the research worker. The advance planning, the organization and mobilization of research facilities, the development of good public relations, the interdisciplinary approach, and the co-ordination of findings are all discussed for the part they played in this broad research program.

Working Together for a Better Understanding of the Nutrition of School Children[1]

Mary Brown Patton, Ercel S. Eppright, Abby L. Marlatt, and Milicent L. Hathaway

Dr. Patton is associate chairman of home economics at the Ohio Agricultural Experiment Station; Dr. Eppright is head of the foods and nutrition department at Iowa State College; Dr. Marlatt is a professor of foods and nutrition in the department of foods and nutrition at Kansas State College; and Dr. Hathaway is a nutrition specialist in the Bureau of Human Nutrition and Home Economics in the U. S. Department of Agriculture.

THE five White House Conferences on child health and welfare during the past several decades and the National School Lunch Act in 1946 are examples of a nation-wide interest in improving the health of our children. These movements are making their contributions and have called public attention to the needs. We all have a responsibility to do what we can to bring about further progress in the improvement of health and well-being of all children. Good nutrition is one of the important factors in health, but it is not safe to assume that present information about the dietary habits alone gives a sound basis for evaluating health. What are the signs of good health? How differently do children eat and at the same time appear to conform to the present standards of good health and development? How do present practices relate to dietary recommendations? How valid are the recommendations? What proportion of our children show signs of poor nutrition?

Studies directed toward the evaluation of the health of children and the many factors related to it are needed to answer these and similar questions. Such studies require co-ordination of the knowledge and skills of persons trained in nutrition, medicine, biochemistry, physiology, and allied fields. The complexity of problems has led to co-operative research among workers in various laboratories in different geographical areas. Through such organizations time and resources are saved, the scope of the work is broadened, the number of cases is increased, and geographical differences can be studied. Such studies contribute basic information to the several fields represented.

Co-operative Nutrition Research in the North Central Region

In 1947, representatives of nutrition research workers in the 11 agricultural experiment stations of the North Central Region and in the Bureau of Human Nutrition and Home Economics planned an investigation of the nutritional status and dietary needs of selected population groups, including school children. The present paper reports the early development of an organization that has been followed in a mass study of approximately 3,000 school children observed since the research was

[1] Contribution No. 4, Subproject 2–"The Nutritional Status of School Children: The School Lunch as an Influencing Factor" of the North Central Region Cooperative Project NC-5, "Nutritional Status and Dietary Needs of Population Groups." (a) Iowa Agricultural Experiment Station, Ames, as Journal Paper No. J-2134, Project No. 1021[2]; (b) Ohio Agricultural Experiment Station, as Journal Paper No. 45-52, Project No. RM 6; (c) Kansas Agricultural Experiment Station, as Paper No. 168, Department of Home Economics, Project No. RRF272; (d) The Bureau of Human Nutrition and Home Economics.

[2] Supported in part by a grant and other assistance from General Mills, Inc., as a part of its nutrition education program.

initiated in 1948. Three states, Iowa, Kansas, and Ohio, participated with the Bureau of Human Nutrition and Home Economics in this study of school children.

Workers in the North Central area had previously carried out a co-operative study on the nutritional status of college women, and work with other age groups seemed a natural outgrowth of this work. Other reasons for undertaking such a study were: (1) nutritional status of school children had been studied in several regions of the United States (*1, 2, 3, 4*), but such studies had not been made in the midwestern states, and the extent of geographical differences needed investigation; (2) present dietary recommendations for children of school age are based on comparatively few studies, and additional information from a large number of children would be helpful in evaluating these recommendations; (3) a restudy of body measurements was needed since these are widely used as indices of nutritional condition and the present standards are based on data collected several decades ago; (4) relationship of blood concentrations of certain nutrients and of the general nutritive condition of the individual to his dietary habits are comparatively new techniques of evaluation and need further study; and (5) the great expansion of lunch programs in schools in Iowa, Kansas, and Ohio, since the passage of the National School Lunch Act in 1946 made it timely to appraise the influence of the school lunch on the diets of children participating and on the dietary habits of their families.

For these reasons a co-ordinated program was developed to study the dietary habits and physical condition and also the mental development and social adjustment of school children in these three states (Iowa, Kansas, and Ohio). It was also planned, whenever possible, to study the general health and nutrition practices of the families of these children. Because of the scope of this research the plan of joint investigation offered many benefits.

Interdisciplinary and Interagency Co-operation

In the preliminary planning for this project four major sources of information were selected as a basis for evaluating the nutritional state and general health of the children to be studied. These were: (1) dietary records; (2) physical growth measurements and, when possible, inspection of general physical condition by a physician; (3) laboratory determinations of blood concentrations of hemoglobin, ascorbic acid, carotene, vitamin A, and alkaline phosphatase; and (4) personal information obtained from interviews with the mothers.

Uniform procedures were developed for obtaining this information in the three states. The techniques used in the study of college women served as a guide for development of those to be used in the present study. For example, the principles involved in obtaining anthropometric measurements of college women were adapted to obtain similar measurements of school children. However, methods of obtaining dietary information from young children had to be explored. Attention was given to new techniques for studying nutritional status which had been developed since the time of the earlier study. Important among these were the microchemical analyses of blood for nutrients such as ascorbic acid, carotene, and vitamin A. All measurements were considered critically in relation to their value in a study of children.

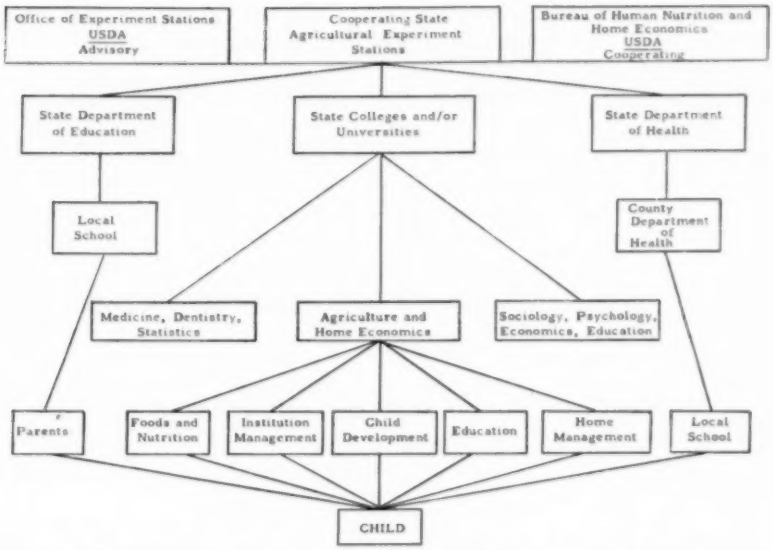
In order to collect such information it was recognized that interdisciplinary co-operation would be necessary and workers in the fields of medicine, biochemistry, dentistry, education, and allied fields were approached.

As the general plan evolved it became apparent that interagency co-operation would be required. The planning committees in each of the three states included members of the following agencies: (1) state department of education, (2) state department of health, and (3) state colleges and universities.

A general plan of co-operation for such a study is shown in the chart. The combined facilities of experiment stations and colleges were available, and working relations were established with the several areas in home economics as well as with related fields in institutions. The state departments of education and health were the avenues for reaching the schools and eventually the children and their parents.

Pilot Study

To test the degree to which the representatives of these various disciplines and agencies could work together and the usefulness of the techniques that had been set up as criteria, a pilot study was carried out in each state in the spring of 1948. Schools were selected in areas near headquarters of the principal workers so that transportation problems were reduced to a minimum, living arrangements for personnel did not change, and laboratory facilities were easily accessible. The school superintendents and principals granted permission to work in the schools selected and helped to organize committees to aid in the interpretation of the program to parents, teachers, and other interested



A GENERAL PLAN OF CO-OPERATION FOR THE STUDY OF NUTRITION OF SCHOOL CHILDREN

persons and to secure their co-operation. Every possible effort was made to explain the purposes and outline the procedures in a clear-cut, concise manner. Parents were reached through group meetings in most cases but if, for some reason, they did not attend these meetings or wished to discuss the project further, visits were made to individual homes. Written permission was secured from parents of each child before any information was collected. There was no active resistance to the program in any of these communities. Blood samples were collected from the children without difficulty. Nutritionists were able to secure confidential information from the parents in practically all cases.

Methods for collecting food intake records were explored. There were indications that if dietary information is to be obtained from the children themselves, those in the fourth, fifth, and sixth grades were best able to supply this information. Children of this age group can spell and write reasonably well, and their interest can be maintained for a period of from three to seven days. The records of the children in the first three grades may be obtained by interview with the child or from the mother. There were indications, in at least some schools, that children in the seventh and eighth grades tended to be less interested than the younger ones.

The management of the school lunch was studied, using the Dreisbach schedule (5). The nutritive value of the lunch as served, the percentage of children eating lunch at school, the price paid for lunch, and acceptance of foods served were factors which were observed.

The physicians and dentists from the colleges worked with nurses and doctors from the health departments in obtaining information on the physical condition of the children. The co-operation of doctors, dentists, biochemists, and nutritionists proved to be efficient and economical of time, money, and resources. Each found that he could give a broader interpretation to the information that he had collected because of its relation to information of others.

As work progressed in the community, interest among school personnel and parents seemed to grow and requests came for reports of results. Co-operation with the departments of health and education facilitated dissemination of the practical applications of this information.

Mass Study

Based upon the experiences at the time of the pilot study, plans were developed in the fall of 1948 for further study of school children in the three states. The statistical laboratories in each of the states co-operated in the development of a design that would provide representative samples of schools according to centers of population, kind of school, and whether or not a lunch was served at school. The state department of education and the superintendents of schools co-operated in the collection of information on the prevalence of school lunches in each state. A report of these data will be presented in a forthcoming publication. Schools were selected by random sampling in metropolitan

TABLE 1

Number of schools studied in each state

STATE	NUMBER OF SCHOOLS IN POPULATION CENTERS OVER 50,000		NUMBER OF SCHOOLS IN CONSOLIDATED DISTRICTS UNDER 50,000		NUMBER OF SCHOOLS IN RURAL DISTRICTS
	Elementary	High School	Elementary	High School	Elementary and High School
Iowa	11	0	26	7	17
Kansas	0	0	8	0	9
Ohio	6	0	4	0	5

areas, in consolidated school districts with populations of less than 50,000, and in rural districts in the open country. Some of the schools did not serve lunch, and others served lunches that conformed to Type A of the federal program. Table 1 and the map show the distribution of the schools studied in the three states.

LOCATION OF SCHOOLS IN MASS STUDY

The plan of procedure followed and the techniques used were the same in the three states and were based on those developed during the pilot study. Types of data collected on 3,000 children in the mass study are shown in table 2. Each state collected such data as were warranted by money and facilities. For instance, Iowa collected 7-day dietaries of the children while Kansas and Ohio have records for only 3 days. Iowa made determinations of alkaline phosphatase, and Kansas and Iowa made studies of mental development and social adjustment of many of the children in those states. X-rays of the chest were made of the children in Ohio.

TABLE 2

Types of data collected on children in Iowa, Kansas, and Ohio

DIETARY	PHYSICAL MEASUREMENTS AND NUTRITIONAL INSPECTION	LABORATORY ANALYSIS OF BLOOD	PERSONAL INFORMATION
3- or 7-day food intake records of child 7-day food consumption of family	Height Weight Chest diameter Bi-iliac diameter Clinical signs of nutritional deficiencies Dental examinations X-rays of bones of wrist X-rays of chest	Hemoglobin Ascorbic acid Vitamin A Carotenoids Alkaline phosphatase	Size of family Source of food supply Income Personality ratings Mental development ratings

Meetings of the workers from these states and from the Bureau of Human Nutrition and Home Economics have been held at least twice a year during the past three years to review progress of work, check procedures, and make plans for analysis of the data. Reports of results have been made to some of the co-operating schools and in many cases are serving as bases for nutritional education programs.

Collection of data continued through the first half of 1951, and information is now available on approximately 3,000 children in the three states. At present these data, as well as those from the pilot study, are being analyzed and prepared for publication.

The main interests of this study were in the health, general nutrition, and physical development of school children. The findings, therefore, make a special contribution to the fund of knowledge needed as a basis for appraising the nutritional status and dietary needs of such children. The information on nutrient intake, for example, should be of value in the appraisal of the present recommended allowances of food nutrients. Further information on the relation of the levels of certain nutrients in the blood and those in the diet will be available. Comparisons can be made of the general health status of children on diets varying in quantity and quality. There will be information on the effect of the school lunch on the dietary patterns and food habits of children and their families. Comparisons can be made of height and weight of present-day children with the same measurements for children of several years ago. Other interrelationships will be studied in an effort to meet the broad objectives set up by the workers in the co-operating agencies.

References

1. ABBOTT, O. D., TOWNSEND, R. O., FRENCH, R. B., and AHMANN, C. F. Effectiveness of the school lunch in improving the nutritional status of school children. Fla. Agr. Expt. Sta. Bull. 426 (1946).
2. CLAYTON, M. M. A four-year study of the food habits and physical condition of grade-school children in Newport, Maine. Maine Agr. Expt. Sta. Bull. 430 (1944).
3. MOSER, A. M. Nutritional condition of children in relation to school lunches in two South Carolina rural communities. S. C. Agr. Expt. Sta. Bull. 359 (1945).
4. ZAYOZ, S. L., MACK, P. B., SPRAGUE, P. K., and BAUMAN, A. W. Nutritional status of school children in a small industrial city. *Child Devel.* **11** (1940), pp. 1-25.
5. DREISBACH, M. B. Some criteria for evaluating school lunch programs. *J. Am. Dietetic Assoc.* **23** (1947), pp. 856-861.

This research is of importance to the 20 million American families who annually can some of their own food supply. On the basis of this study, the convenient raw-pack method for canning snap beans will be issued by the Bureau of Human Nutrition and Home Economics and made available to extension workers, teachers, editors of magazines and newspapers, editors of commercial publications on canning, and radio broadcasters concerned with providing homemakers with procedures that produce a safe, palatable home-canned product.

Canning Snap Beans: Precooked and Raw Pack

Elsie H. Dawson, Gladys L. Gilpin, Helen W. Warren, and Edward W. Toepfer[1]

Mrs. Dawson and Miss Gilpin are food specialists, Mrs. Warren a chemist, and Dr. Toepfer a food chemist in the Bureau of Human Nutrition and Home Economics in the U. S. Department of Agriculture.

THE goal in home canning is a safe product that tastes good and retains as much of the original nutritive value of the food as possible. These product qualities will be influenced by the procedures used in canning.

In a previous study in this laboratory (*1*), canned snap beans that were precooked and packed hot before processing rated lower in palatability and nutritive value than frozen snap beans. The canned snap beans were soft in texture, tasted overcooked, and were weak in natural flavor. Ascorbic acid retention of the hot-packed beans averaged 56 per cent; thiamine retention, 66 per cent. Theissen (*2*) compared ascorbic acid retention and palatability of canned snap beans packed raw or after precooking and processed in No. 2 tin cans. Precooked packs were sealed without exhausting and processed for 25 minutes at 240°F. Raw packs were exhausted, sealed, and processed for 30 minutes at 240°F. No data as to the relative sterilizing values of the two processes were reported other than the observation that maximum temperature thermometers recorded temperatures of 240°F in both raw and precooked packs within similar processing times. Ascorbic acid retentions in the canned beans were reported to be better by approximately 26, 32, and 33 per cent in the raw than in the precooked packs, depending on whether the beans were packed as 1-inch, ¼-inch, or French cuts. Palatability scores showed the raw-packed beans to be superior to the precooked packs on the basis of flavor and texture as well as ascorbic acid retention.

The purpose of the investigation reported here was to compare the quality of canned snap beans packed in glass home-canning jars both raw and after precooking and given processes having equivalent sterilizing values. Quality factors studied included color, flavor, texture, and content of thiamine and ascorbic acid.

Procedure

Snap beans of the Black Valentine variety were purchased on the local market. The beans were sorted and washed twice in tap water and twice in distilled water. They were divided into two lots to provide parallel samples for canning as raw and as precooked packs. The tip ends were trimmed off and the beans cut into 1-inch pieces in preparation for both canning methods.

Preliminary to the preparation of packs for purposes of comparison, heat penetration studies were

[1] The authors wish to acknowledge the assistance of Olivia A. Hammerle, formerly with the Bureau of Human Nutrition and Home Economics, in the preparation and processing of samples, of Elsie F. Dochterman and Albert B. Parks in the statistical analysis of the data, and of Howard Reynolds in the determination of processing requirements.

made to establish the processing time at 240°F for pint jars of raw-packed beans that will provide a sterilizing value equivalent to that of the currently recommended process of 20 minutes at 240°F for precooked packs. The methods used in obtaining heating and cooling data and for applying these data to the calculation of processing times are detailed in an earlier publication by Toepfer, Reynolds, Gilpin, and Taube (3).

For this study, raw, cut snap beans were packed directly into cold pint jars. In order to insure a solid pack, the beans were shaken down when the jars were one-fourth, one-half, and three-fourths full and pressed down moderately hard when the last quantity of beans was added. The jars were then filled to one-half inch headspace with boiling distilled water and two-piece metal closures applied.

Temperatures during processing at 240°F and during cooling were determined in 12 jars, six in each of the two full cooker loads. The results showed that 20-minute, 240°F processes provided equivalent sterilizing values for both raw and precooked pint-jar packs of snap beans. When beans were packed raw into jars and covered with boiling water, cold-point temperatures after filling averaged 179°F as compared with 182°F for precooked packs. At the beginning of the processes, average temperatures were practically the same in both packs, and rates of heat penetration during processing did not differ significantly.

On the basis of the above noted determination, raw packs of snap beans in pint jars, prepared as described, were processed for 20 minutes at 240°F for quality comparisons with precooked packs.

For the precooked pack, 2¼ quarts of the cut snap beans were boiled for five minutes in 1 quart of distilled water. The beans were then packed into hot pint jars and the cooking liquid added, leaving one-half inch headspace. The jars were sealed and processed for 20 minutes at 240°F.

The day after processing, six jars from each method were stored at 32°F for control purposes and six jars at a room temperature of 75°F for eight months, then used for palatability and color determinations. These determinations were also made on the freshly processed samples. For chemical analyses four jars from each method were stored at –40°, 32°, and 75°F for 8 months.

For palatability evaluation, samples of the canned snap beans were heated to the boiling point and served immediately on warm plates to a panel of six judges. The samples were coded and presented to the judges in random order. Color, natural flavor, off-flavor, texture, and over-all palatability were the factors rated on 10-point scales. Ten was the highest possible score for all factors except texture, which had an optimum score of 5, with scores at the top of the scale registering toughness and those at the bottom indicating mushiness.

For chemical analysis of reduced ascorbic acid and thiamine content of the canned beans, the liquid and drained weights were obtained from each jar. The liquid and solid portions were blended in order to obtain a slurry from which representative samples could be drawn for the analyses. Reduced ascorbic acid was determined by the indophenol xylene extraction procedure (4) and thiamine by the thiochrome method (5). For comparative purposes, the amount of ascorbic acid and thiamine in 100 grams of drained weight of beans was calculated.

Variance analyses of palatability and analytical data were made to assist in interpretation of the results.

Results

Palatability evaluations of freshly processed snap beans indicated that beans prepared by the raw-pack method were superior in quality to those that were precooked before packing. The panel of judges rated them better in color, flavor, texture, and over-all palatability (table 1). Differences in

TABLE 1

Average palatability scores for precooked and raw-packed home-canned snap beans*

STORAGE TIME AND TEMPERATURE	PACK	COLOR	NATURAL FLAVOR	ABSENCE OF OFF-FLAVOR	TEXTURE	OVER-ALL PALATABILITY
Freshly processed	Precooked	4.5	3.5	4.4	2.9	3.6
	Raw	5.2	4.5	5.0	3.7	4.5
Stored 8 months at 32°F	Precooked	4.8	4.2	4.8	4.2	4.2
	Raw	5.2	4.3	4.5	4.8	4.4
Stored 8 months at 75°F	Precooked	4.5	3.6	4.0	3.2	3.6
	Raw	4.7	3.8	4.2	4.1	3.9

* Average of six replicates rated by a six-member panel. Score of 10 is highest possible score and 1, the lowest, except for texture scores, which range from 10 for very tough to 5 for tender and crisp, to 1 for soft and mushy.

color and texture scores for the precooked and raw packs were statistically significant at the 1 per cent level, in flavor scores at the 5 per cent level (table 2). A strong flavor in the precooked beans, which some of the judges called overcooked or over-processed, was less marked in those that were raw-packed; also, more of the natural flavor remained in the raw-packed than in the precooked beans. Although all of the canned beans were too tender in texture when tested soon after processing, the raw-packed samples were rated slightly too tender while the hot-packed samples were rated moderately soft in texture.

TABLE 2

Analysis of variance of palatability scores for precooked and raw-packed home-canned snap beans

SOURCE OF VARIATION	DEGREES OF FREEDOM	MEAN SQUARES		
		Color	Natural Flavor	Texture
Treatment	1	1.96*	1.61†	5.45*
Storage	2	0.54	0.86	4.20*
Treatment x storage	2	0.13	0.67	0.06
Error	30	0.23	0.28	0.50

* Significant at the 1 per cent level.
† Significant at the 5 per cent level.

Palatability evaluations after storage for 8 months at 32°F and at 75°F indicated very little change in color and flavor of either the precooked or raw-packed snap beans. Statistically the differences in mean scores before and after storage were non-significant. Changes in texture during storage, however, were statistically significant. In both precooked and raw packs, texture scores were higher after storage than immediately after processing, especially for canned beans stored at 32°F. Raw-packed beans were rated tender and crisp, and precooked beans were rated only slightly too tender after storage for 8 months at 32°F.

Drained weight of beans averaged 69 per cent of the total weight for the precooked pack and 59 per cent for the raw pack. Thus, more beans can be packed into a jar if the beans are heated for five minutes prior to packing.

Average values for ascorbic acid and thiamine content of precooked and raw-packed home-canned snap beans are given in table 3. Because of differences in solids content of the two packs, these data are presented as (a) reduced ascorbic acid and thiamine in liquid and beans, expressed as milligrams per 100 grams of drained beans, and (b) estimated content of reduced ascorbic acid and thiamine in the drained beans. The latter estimates were made on the basis of other studies (*1*) which have shown that the distribution of ascorbic acid and thiamine between liquid and solid portions of canned snap beans parallels the percentages of liquids and solids in the pack. Thus, further analysis of previously reported data on precooked home-canned snap beans in this laboratory (*1*) showed that approximately 68 per cent of the pack was drained solids and 32 per cent was liquid. Similarly, about 72 per cent of the ascorbic acid and 70 per cent of the thiamine were contained in the solid portion and 28 and 30 per cent, respectively, in the liquid portion. Brush, *et al.* (*6*) have reported similar distribution of ascorbic acid and thiamine between the liquid and drained solids of commercially canned snap beans.

TABLE 3

Average reduced ascorbic acid and thiamine content of precooked and raw-packed home-canned snap beans

STORAGE TIME AND TEMPERATURE	PACK	NUMBER OF JARS	LIQUID	DRAINED SOLIDS	REDUCED ASCORBIC ACID PER 100 GRAMS DRAINED SOLIDS		THIAMINE PER 100 GRAMS DRAINED SOLIDS	
					In Liquid and Beans	Estimated in Drained Beans	In Liquid and Beans	Estimated in Drained Beans
			grams	*grams*	*milligrams*	*milligrams*	*milligrams*	*milligrams*
8 months at —40°F	Precooked	4	193.8	224.1	8.09*	4.36*	0.0710	0.0380
	Raw	4	228.8	201.6	10.68	5.02	.0671	.0313
8 months at 32°F	Precooked	4	84.4	327.5	6.28	5.00	.0543	.0432
	Raw	4	149.5	272.7	7.76	5.00	.0566	.0366
8 months at 75°F	Precooked	4	108.1	322.8	4.69	3.50	.0501	.0375
	Raw	4	148.8	277.3	6.42	4.18	.0496	.0322
Standard error of difference					0.834	0.450	.00366	.00222
Difference required for significance								
5 per cent level					1.38	0.96	.0077	.0047
1 per cent level					1.90	1.33	.0105	.0064

* Data from only 1 jar.

The data of table 3 show that over-all retention of ascorbic acid in liquid and beans was significantly higher in the raw packs than in the precooked packs of snap beans. They also show that the proportion of liquid is higher in the raw than in the precooked packs, the average liquid portions being 41 and 31 per cent, respectively, of the total content. On the assumption that the distribution of ascorbic acid was similar to the proportion of liquid and solids, the ascorbic acid content of the drained beans did not differ significantly in raw and precooked packs. The data indicate somewhat greater loss of ascorbic acid during storage at 75°F than at 32°F.

There were no real differences in the over-all retention of thiamine in liquid and beans in the precooked and raw packs stored under comparable conditions for 8 months at −40°F, 32°F, or 75°F. However, the retention in beans held at −40°F was significantly higher than that in those stored at 32° and 75°F. The estimated thiamine contents of the drained beans in the precooked packs were slightly higher than those of the raw pack, and the differences were statistically significant. The drained beans in the precooked pack stored at 32°F were significantly higher in thiamine than those stored at 75°F.

Although the ascorbic acid contents of the drained beans from the precooked packs and from the raw packs were similar under comparable conditions of storage, the thiamine content of drained beans was greater in the precooked packs. In a previous publication (*1*) it has been shown that heating home-canned snap beans for serving further reduced the ascorbic acid content with little change in the thiamine. Because the raw pack contained the greatest proportion of liquid it is presumed that more cooking liquid would normally be left after heating this pack for serving. Unless the liquid portions are consumed, the nutritive value of the hot-packed beans as eaten will be somewhat higher with respect to thiamine than the cold packs but approximately equal with respect to ascorbic acid.

Summary

The convenient raw-pack method can be used in the home canning of snap beans without increasing the processing time over that required for use with precooked packs.

Raw-packed snap beans rated higher in palatability than parallel samples of beans that were precooked five minutes before processing. Drained beans averaged 59 per cent of the total weight in the raw pack, 69 per cent in the precooked pack. Chemical analyses showed no real differences in ascorbic acid content in the drained solids of raw and precooked packs, but in thiamine content the drained solids were lower in the raw pack than in the pre-cooked pack. The ascorbic acid and thiamine contents of canned snap beans in the precooked pack stored at 32°F were higher than was true of those stored at 75°F; the values for the raw-packed beans were not significantly different for these storage temperatures.

References

1. Dawson, E. H., Reynolds, H., and Toepfer, E. W. Home-canned versus home-frozen snap beans. *J. Home Econ.* **41** (1949), p. 572.
2. Theissen, E. J. Conserving vitamin C by varying canning procedures in snap beans, tomatoes, peaches, and pears. *Food Research* **14** (1949), p. 481.
3. Toepfer, E. W., Reynolds, H., Gilpin, G. L., and Taube, K. Home Canning Processes for Low-Acid Foods. U. S. Dept. Agr. Tech. Bull. No. 930 (1946), 28 pp.
4. Nelson, W. L., and Somers, G. F. Determination of ascorbic acid. Application of the indophenol xylene extraction method to the determination in large numbers of tomato and tomato juice samples. *Ind. & Eng. Chem.*, Anal. Ed. **17** (1945), p. 754.
5. Association of Vitamin Chemists, Inc., *Methods of Vitamin Assay.* New York: Interscience Publishers, Inc. 1947, p. 51.
6. Brush, M. K., Hinman, W. E., and Halliday, E. G. The nutritive value of canned foods: V. Distribution of water soluble vitamins between solid and liquid portions of canned vegetables and fruits. *J. Nutrition* **28** (1944), p. 131.

AHEA Doctoral Research Fellowship

The American Home Economics Association announces the establishment of an AHEA Doctoral Research Fellowship to be supported by funds from life membership payments to the Association. Action approving this use of life membership payments effective with the 1951-52 fiscal year was taken at the 1952 annual meeting. The fellowship stipend has been set at $1500 per year, to be increased when possible and if desirable. The first award will be made for the year 1954-55. Awards will be made by the AHEA Fellowship Awards Committee. Starley M. Hunter is the present committee chairman.

Menu patterns provide invaluable background to persons who are concerned with group nutrition teaching. Extension workers and teachers can use the findings of studies such as this one to direct their emphasis in effective teaching of foods and nutrition. Nutritionists find menu patterns useful in determining where improvement is needed in dietary practices.

Menu Patterns in the Delta Cotton Area[1]

Dorothy Dickins and Beulah V. Gillaspie

Dr. Dickins is head of the home economics department of the Mississippi Agricultural Experiment Station. At the time this study was made, Dr. Gillaspie, now dean of the School of Home Economics at Purdue University, was professor and head of the home economics department at the University of Arkansas and home economist at the Arkansas Agricultural Experiment Station.

ARE there menu patterns that are characteristic of farm families in the Delta cotton area? Are there differences in the patterns of white and Negro families and in the tenure groups such as owner, renter, and sharecropper families? Since families eat foods in combination, nutrition education can be more effective if foods to meet the nutritional needs are recommended within the framework of typical menu patterns.

The present analysis is based on the menus served at morning, noon, and evening meals and as packed lunches or between-meal snacks during one week in the late winter and early spring of 1948 by Arkansas and Mississippi families included in the Southern Farm Family Food Consumption Study. Previous reports from this study have shown that kinds and amounts of food consumed by white and Negro families and by owner, renter, and sharecropper families in the Delta cotton area differed greatly.[2] White families and farm owner families had amounts more nearly meeting the National Research Council's recommended allowances than had Negro families and tenant families.

[1] Contribution from the Southern Region Cooperative Project on Farm Family Food Consumption (S-4), the Experiment Stations of Arkansas, Mississippi, South Carolina, Tennessee, and Virginia, Institute of Statistics at North Carolina State College, and Bureau of Human Nutrition and Home Economics, USDA, participating. Published with approval of the directors of co-operating stations and agencies, and of the Southern Directors as Southern Cooperative Journal Series Article No. 2.

[2] Family Food Consumption in Three Types of Farming Areas of the South: I. An Analysis of 1947 Food Data, Dorothy Dickins, *et al.* Southern Cooperative Series, Bulletin 7, June 1950, p. 7; and Family Food Consumption in Three Types of Farming Areas of the South: II. An Analysis of Weekly Food Records, Late Winter and Early Spring, 1948, Ada Moser, *et al.* Southern Cooperative Series, Bulletin 20, November 1951.

Meals Served

Table 1 shows the average number of meals served at morning, noon, and evening and as packed lunches or between-meal snacks during the study week by white and Negro families in the three farm tenure groups.

Nearly one-half of the Negro owners (45 per cent) and more than one-half of the Negro renters and sharecroppers (53 and 61 per cent, respectively) served only two meals a day. Families who served two meals four or more days during the week when records were kept were classified as

TABLE 1

Average number of meals served during study week by white and Negro families classified by farm tenure

Race and tenure	Number of families	Average number of meals per family served during study week			
		Morning meals	Noon meals	Evening meals	Packed lunches and between-meal snacks
White families					
Owners	26	7.0	6.5	6.8	4.2
Renters	29	7.0	6.2	6.6	3.3
Sharecroppers*	52	6.8	5.9	6.6	2.6
Negro families					
Owners	20	6.9	4.9	6.4	2.7
Renters	34	6.9	3.5	6.6	2.4
Sharecroppers*	147	6.6	3.6	6.0	2.4

* The sharecropper family ordinarily gets a smaller proportion of the crop than does the renter family. For definitions of the tenure groups see Southern Cooperative Series, Bulletin 7, page 141.

following the two-meal-a-day pattern. No white owner family and only 3 per cent of the white renter and 10 per cent of the white sharecropper families followed the two-meal-a-day pattern.

The number of meals served was more related to the race of the family than to its net income. In this study white sharecropper, Negro owner, and Negro renter families averaged about the same net annual income ($1,255 for white sharecroppers, $1,529 for Negro owners, and $1,272 for Negro renters). Net incomes of white owners averaged $4,264, of white renters $2,418, and of Negro sharecroppers $819. Only families with both husband and wife and one or more children from 2 to 18 years of age were included in this study.

Menu Items That Go Together

In this analysis food items making up the menu are designated as menu items. A menu item is any one dish such as beef stew, boiled Irish potatoes, apple and carrot salad, coffee, sirup, ham sandwich, butter, gravy. Sugar and cream used in coffee, on cereal, or on fruit were not regarded as separate menu items.

From a tabulation of the menu items served by a representative sample of families in the area a list of 90 items most frequently served was made. These 90 menu items were coded on hand punch cards with space for recording on what day and at what meal each item was served and also the number of times each item was served at lunches and between-meal snacks during the week.[3]

One of the most important findings of this analysis is the many combinations of menu items within the same meal. For example, 65 morning meals served by white owners all serving fried eggs were examined, and 51 different combinations of menu items were noted in these 65 breakfasts. Sixty-five fried-eggs breakfasts served by Negro sharecroppers were examined with the thought that here might be found more uniformity in breakfasts served. But 53 different combinations of menu items were used in these 65 breakfasts. An examination of noon and evening meals with boiled dried beans and with boiled dried peas presented similar diversity.

[3] The hand punch card was developed by the technical committee of the Southern Farm Family Food Consumption Study. In addition to the hand punch card for each family there was a Summary and Total Sheet in which the 14 summary menu items were specified, and total menu items in each food group and for the family were given. For further details concerning methods, write to the home economics department of the Mississippi Agricultural Experiment Station.

Even though menus served at morning, noon, and evening meals could not be classified into clear-cut patterns, it was found that they could be classified into several broad subgroups which might be useful in planning nutrition education programs in cotton areas of the South.

Morning meals. The morning meals were classified into four patterns according to whether they included: I, meat; II, eggs; III, meat and eggs; or IV, neither meat nor eggs (table 2). Since biscuit and coffee were usually also served with meat and/or eggs, they are included in the description of the morning meal patterns even though in a few morning meals coffee or biscuit or both were not served.

Meats included menu items regarded as meat by the family, such as fried salt pork, fried fish, boiled spareribs, Bologna, smothered chicken, canned salmon. In this study there was no one meat menu item used at breakfast once or more by the majority of families in all groups. There was, however, a meat menu item used by the majority of families once or more in each of two groups—fried bacon by white owners and fried salt pork by Negro sharecroppers.

Morning meals without meat or eggs, pattern IV, often consisted of cereal (such as rice or oatmeal), biscuit, and coffee, with or without extra items. About 10 per cent of the morning meals in every group except that of white owners consisted of biscuit and a beverage, with or without table fat and/or a sweet. Only 4 per cent of the morning meals of white owners were of this type.

In addition to the items described in the menu patterns for morning meals there were extra menu items such as sirup, table fat, sweet milk, jelly, rice, and meat gravy. The median number of these extra items is shown in table 2. Any menu item in addition to one meat, biscuit, and coffee in pattern I was counted as an extra item. Similar procedure was used in figuring extra menu items in patterns II and III. In pattern IV all items were counted as extra items.

Using this procedure for classifying morning meals, one finds that the most typical pattern of the white owner and renter family can be described as meat, eggs, biscuit, coffee, and three extra menu items (such as butter, sirup, jelly or preserves). The most typical morning meal pattern of Negro families in all three tenure groups can be described as a meal of meat, biscuit, coffee, and one or two extra menu items (such as sirup, boiled rice). There was no typical pattern for white sharecroppers.

During the study week, more families had diets

TABLE 2

Patterns of morning meals served by six race-tenure groups during one week (in February and April, 1948)

MORNING MEAL PATTERNS*	RACE-TENURE GROUPS						MEDIAN NUMBER OF EXTRA MENU ITEMS SERVED BY					
	White Families			Negro Families			White Families			Negro Families		
	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*number*	*number*	*number*	*number*	*number*	*number*
I. Meat, biscuit, coffee	19	22	27	44	45	54	3	3	2	2	2	1
II. Eggs, biscuit, coffee	22	24	28	20	19	8	3	3	3	2	2	1
III. Meat, eggs, biscuit, coffee	51	34	26	15	11	11	3	3	2	2	2	1
IV. All other combinations without meat and/or eggs	8	20	19	21	25	27	5	5	4	4	3	3

* Directions for classifying into four morning, noon, and evening meal patterns may be obtained from the home economics department of the Mississippi Agricultural Experiment Station.

which did not meet the National Research Council's recommended allowances for calcium, vitamin A value, and ascorbic acid than for any of the other essential nutrients. Citrus fruit and/or fruit and vegetable juices were not in the morning meal patterns except of relatively few families, principally the white owner group. The percentage of owner families serving these menu items at least once during the study period was 46. For white renters, the percentage was 21, and for white sharecroppers 13. For the three Negro groups it was less than 10 per cent—only 1 per cent for Negro sharecroppers. "Sweet milk" was used as a breakfast menu item by the majority of families in only two groups—white and Negro owners.

Noon and evening meals. The noon and evening meals were classified into four patterns according to whether there were: I, meat and vegetable; II, meat, no vegetable; III, vegetable, no meat; or IV, neither meat nor vegetable. In developing these patterns it was thought that the definitions of the patterns might include one meat and two vegetables. But a summary of noon and evening meals revealed that in patterns I and III less than one-fifth of the meals by Negro renters and sharecroppers had as many as two vegetables, only one-third by Negro owners. Therefore, it was decided that patterns should be based on one vegetable even though somewhat more than a half of these meals by white sharecroppers and more than two-thirds by white renters and owners had two or more vegetables. The percentage of meals with two or more vegetables served at noon and in the evening was about the same though there was some tendency in the three white groups towards a lower proportion of evening than of noon meals with two or more vegetables.

Definitions of noon and evening meal patterns originally included subdivisions of patterns I, II, and III into those with or without a dessert. Fruits used as desserts were here included along with the desserts. This further subdivision reduced the percentage of meals in any one pattern, especially in the white owner group where about one-half of the families with each pattern served a dessert.

Noon and evening meals in the first three patterns were also classified into those with and without a beverage. Here the white owners were not affected since most of them served a beverage, but other groups were, especially Negro sharecroppers of whom only about one-third had a beverage.

Study of the menus of these Delta cotton area families showed definitely that patterns to suit all groups of farm families within the area must of necessity be quite general in character. As has been shown, these groups of families varied greatly as to economic status.

Very few of the noon meals were meals with neither meat nor vegetables, pattern IV (table 3). About one-third of the noon meals with no meat or vegetables were meals of a bread and a beverage with or without a sweet and/or table fat. Other common meals in this pattern were meals such as fried eggs, biscuit, coffee; sandwich (not meat) and a beverage; biscuit and sirup; rice, gravy, biscuit.

The most common noon meal pattern for white sharecroppers and Negroes in all three tenure groups was vegetable and no meat with two or three added menu items; for white owners and

TABLE 3

Patterns of noon meals served by six race-tenure groups during one week (in February and April, 1948)

NOON MEAL PATTERNS	RACE-TENURE GROUPS						MEDIAN NUMBER OF EXTRA MENU ITEMS SERVED BY					
	White Families			Negro Families			White Families			Negro Families		
	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*number*	*number*	*number*	*number*	*number*	*number*
I. Meat and vegetable	46	43	31	19	15	17	5	5	4	4	2	2
II. Meat, no vegetable	17	12	14	17	22	22	3	3	3	2	2	2
III. Vegetable, no meat	31	39	50	49	49	52	4	5	3	2	2	2
IV. Neither meat nor vegetable	6	6	5	15	14	9	2	4	3	3	3	2

renters the noon meal of vegetable with meat was more important. These meals had, in addition, five extra menu items. Added menu items differed greatly from family to family and group to group. One of these items was almost invariably either corn bread or biscuit. For white owners and renters there was often another vegetable, a dessert, and a beverage—either sweet milk or coffee.

The vegetable, no-meat meal was important for all race-tenure groups at evening except white owners, where the highest percentage of evening meals contained meat as well as vegetables (table 4). For Negro renters and sharecroppers the meat, no-vegetable meal was, however, as important as was the vegetable, no-meat meal. Extra menu items were similar to those at the noon meal, but the beverage was more often sweet milk or buttermilk than at the noon meal.

Variety from day to day and differences among families were more marked for noon and evening than for morning meals. Fewer of the same menu items appeared in the noon and evening meals. Corn bread and biscuit were the only menu items served at noon and evening meals by the majority of families in all six groups. Biscuit might be characterized as the most popular menu item served at the three meals. Corn bread was served, however, at least once during the study period at noon and evening meals by a greater percentage of families in all six race-tenure groups than was biscuit. But corn bread was not a breakfast bread to these families.

This discussion of menu items that go together has been centered thus far on combination of items at the three meals. There is also the problem of combination of menu items within the meal. In this connection a study was made of the association of biscuit and corn bread at the noon and evening meals with boiled dried beans, canned English peas, boiled turnip greens, and boiled dried peas.[4] A highly significant association was found in the type of vegetable eaten with biscuit *versus* corn bread. Biscuit was more often eaten with boiled dried beans and canned English peas while corn bread was more frequently eaten with turnip greens and boiled dried peas.

[4] X2 test for independence and association.

TABLE 4

Patterns of evening meals served by six race-tenure groups during one week (in February and April, 1948)

EVENING MEAL PATTERNS	RACE-TENURE GROUPS						MEDIAN NUMBER OF EXTRA MENU ITEMS SERVED BY					
	White Families			Negro Families			White Families			Negro Families		
	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers	Owners	Renters	Share-croppers
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*number*	*number*	*number*	*number*	*number*	*number*
I. Meat and vegetable	40	34	37	24	13	14	4	4	3	3	2	2
II. Meat, no vegetable	24	15	14	20	33	35	5	4	3	3	3	2
III. Vegetable, no meat	29	44	42	41	35	36	5	4	3	3	2	2
IV. Neither meat nor vegetable	7	7	7	15	19	15	4	3	4	2	3	3

A study of biscuit and corn bread at noon and evening meals with fried cured ham and shoulder and fried fresh fish showed no significant statistical association or preference in meat eaten with biscuit *versus* corn bread. Fried ham or shoulder was eaten as frequently with biscuit as with corn bread; biscuit was eaten as readily with fried fish or ham; corn bread is as often eaten with fried fish as with ham.

Packed lunches or between-meal snacks. While menu items in the bread, beverage, and vegetable groups were the most important served at meals, those in the bread, sweets, and fruit groups were the most important served in packed lunches and as between-meal snacks. The most important menu items in the breads, sweets, and fruit food groups served in such lunches and snacks and the percentage of familes serving were as follows:

	BISCUIT	CORN BREAD	CANDY	ORANGES	OTHER RAW FRUIT
White owners	27	12	23	31	39
White renters	28	3	28	21	28
White sharecroppers	14	8	25	12	17
Negro owners	30	10	15	25	15
Negro renters	32	18	6	6	6
Negro sharecroppers	44	22	8	9	7

Most of the oranges and other raw fruit (usually apples) eaten by family members of Negro and of tenant families were eaten in packed lunches or at between-meal snacks. The fruit eaten at meals was usually canned or dried fruit, more often canned than dried.

Using Menu Patterns in Nutrition Education

Menu patterns such as presented in this article can be used by home economists working with these and similar groups as a basis:

1. For deciding which menu items or dishes should be stressed in lessons and/or demonstrations in food preparation
   For example, biscuit and corn bread are shown to be the most common menu items used by all families. Therefore, it is important that members of families with menu patterns such as these learn to make biscuit and corn bread that are palatable and that will contribute the maximum nutritive value.
2. For making suggestions for substitutions
   For example, in meals of Negro and tenant families, fortified oleomargarine might well be substituted for some of the cooking fat without increasing food costs.
3. For knowing what menu items families in the group consider are appropriate for morning meals, evening meals, between-meal snacks
   For example, one would begin a program for use of fruits rich in vitamin C with the use of such fruits at the morning meal if working with white owners, but with the use of such fruits in packed lunches and at between-meal snacks if working with Negro and tenant families. For families using little or no milk for drinking, the evening meal would be the meal on which to begin the emphasis, since this is the meal in which families are more likely to have milk for drinking.
4. For planning long-time programs to improve diets
   For example, limited variety as is shown in menu patterns of some of these race-tenure groups points to need for increased emphasis on production for home use. Variety in types of food and in menu items makes for a more pleasing diet and also may mean a more nutritious diet than a limited number of types of foods and menu items. Nutrients occur in different amounts in different classes of foods, and variety in menu items is more likely to supply enough of the essential nutrients than is sameness of such items. Then, too, variety provides a greater chance for getting unknown factors.

Any home economist could use some of the techniques used in this study in making informal studies of menu patterns served in families of the groups with whom they work.[5]

[5] A copy of other tables which could not be included in this report, because of limited space, may be obtained from the home economics department of the Mississippi Agricultural Experiment Station. These are: (1) the percentage of families serving at least one menu item in each of 15 food groups and average number of menu items in each group served by families, classified by race and tenure; (2) the menu items used at least once during the report week by the majority of families at morning, noon, and evening meals, classified by race and tenure; (3) total number of different kinds of menu items served by families in the six race-tenure groups during the report week.

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Findings of this study of the effects of laundry and wear on various cotton uniform materials will be of aid to the many women who wear such uniforms and welcome guidance in their selection. Garment manufacturers and teachers and students of textiles and clothing will gain in understanding of the factors which contribute to textile satisfaction.

Roles of Laundering and Wear in Deterioration of Four Types of Cotton Uniform Fabrics[1]

Ethel L. Phelps, Frances P. McLean, Marian M. Moore, Louise S. Greenwood, June Very, Norma H. Holm, and Vivian White

Miss Phelps is a professor of textiles and clothing in the School of Home Economics at the University of Minnesota. The other authors are former research assistants in the same school.

THE service life of the uniforms worn by nurses, dietitians, and other workers is affected by both wear and laundering, since, due to their use and the nature of the materials of which they are made, they must be subjected to frequent laundering as well as to wear. The serviceability of such garments, therefore, is vitally important to the consumer who is well aware of the deterioration which results from the combination of laundering and wear.

Garments of this sort customarily are not laundered in the home, are little influenced by changes in fashion, and are worn to the end of their serviceability. Hence, those portions of the breakdown which ultimately cause such garments to be discarded, and which can be attributed to wear and/or laundering, are significant both to the user and the launderer. Harwood (*1*) has suggested that the laundry often receives an undue share of blame in connection with the failure of textiles.

To compare the relative serviceability of four types of cotton materials used for such uniforms, certain fabric properties have been measured both after laundering alone and after wear with laundering (*2*). From the data accumulated it has been possible to separate the deterioration which is due to laundering from that due to the combined effects of wear and laundering, and thus to isolate the portion of breakdown which is due to wear alone.

Experimental procedure. Broadcloth, poplin, suiting, and jean are cotton fabrics commonly used for uniforms worn by nurses and dietitians. One piece of each of these fabrics, of good quality, considered to be characteristic of its kind (table 1), was selected for study. These materials were made into uniforms which were worn by nurses and attendants in doctors' and dentists' offices in St. Paul. Medical technicians were excluded from the experiment to avoid chemical damage which might result from that work.

Three uniforms of each fabric were assigned to each of five subjects. Each garment was worn for one working day and then laundered with starching at a commercial laundry which follows procedures recommended by the American Institute of Laundering. In order to show the effect of increasing wear, five replicate uniforms of each fabric were withdrawn from service after 20, after 40, and after 60 days of wear with a corresponding number of launderings. They were then sampled and their characteristics measured to permit objective comparison with the new materials and with control lengths of the same fabrics which had been concurrently laundered only, with starching, at the same laundry. The relative effects of laundering only and of wear with laundering have been shown by changes in fabric weight, thickness, breaking strength (according to the grab method), bursting strength, and fabric elongation (tables 2 and 3). All measurements of fabric characteristics were determined under standard atmospheric conditions (*3*), and all statements regarding measured differences are based upon statistical proof of significance.

[1] Paper number 2711, Scientific Journal Series of the Minnesota Agricultural Experiment Station.

Differences among fabrics and wearer. Each of the materials studied had the characteristic weave structure, type of yarn, and relationship between number per inch and size of warp and filling yarns of its type. From table 1 it is seen that the suiting was one of the heaviest and thickest of the four materials, that it was made of the coarsest yarns and had the fewest twists per inch, and that it had a relatively coarse structure as shown by the number of yarns per inch. While its yarns were strong,

TABLE 1

Properties of the four cotton fabrics used to study serviceability

PROPERTY MEASURED		UNIT OF MEASUREMENT	FABRICS STUDIED							
			Broadcloth		Poplin		Suiting		Jean	
			Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Weight		oz per sq yd	3.43	0.017	4.63	0.034	5.50	0.045	5.49	0.057
Thickness		1/1,000 inch	8.75	0.264	11.90	0.211	14.75	0.425	14.15	0.242
Fabric count	W*	number per inch	137.8	1.874	108.9	0.568	52.4	0.699	101.1	0.994
	F		77.5	0.527	50.1	0.568	48.6	0.516	62.5	0.972
Yarn number	W	cotton system	49.70	2.541	24.60†	1.430	13.23	1.122	21.04	1.421
	F		43.30	2.214	23.80	0.422	14.74	0.580	22.30	1.619
Twist of yarn	W	number per inch	33.68	2.014	9.45‡	0.455	14.79	0.409	22.92	1.353
	F		20.54	1.877	15.50	1.160	14.76	0.910	22.58	1.428
Yarn strength	W	grams	125.0	21.382	317.5	30.886	692.0	134.970	299.5	56.798
	F		158.2	26.620	337.0	32.622	597.5	89.200	276.8	46.813
Yarn elongation	W	centimeters per 10-inch gauge length	1.04	0.160	1.22	0.158	1.54	0.308	1.43	0.238
	F		1.14	0.150	1.58	0.171	1.51	0.256	1.44	0.252
Fabric strength (grab method)	W	pounds	65.30	1.549	115.90	3.381	64.65	4.378	83.85	3.544
	F		36.90	1.955	48.10	1.049	67.65	3.266	54.70	2.497
Fabric elongation (grab)	W	inches per 3-inch gauge length	0.490	0.032	0.490	0.057	0.370	0.048	0.450	0.053
	F		0.320	0.063	0.400	0.000	0.520	0.035	0.440	0.052
Bursting strength		pounds	46.45	5.946	87.50	10.599	62.35	7.071	97.80	6.885
Bursting elongation		inches per 1-inch diameter	0.190	0.021	0.215	0.024	0.230	0.026	0.270	0.048

* Measurements made in the warpwise and fillingwise directions indicated by W and F, respectively.

† Yarn number for the 2-ply yarn as a whole.

‡ Plying twist for the 2-ply yarn.

TABLE 2

The effect of increasing laundering with starching on the four fabrics studied

FABRIC	NUMBER OF LAUNDERINGS	FABRIC PROPERTIES							
		Weight in Ounces per Square Yard	Thickness in 1/1,000 Inch	Fabric Breaking Strength (Grab) in Pounds		Bursting Strength in Pounds	Fabric Elongation (Grab)* in Inches		Bursting Elongation* in Inches
				Warpwise	Fillingwise		Warpwise	Fillingwise	
Broadcloth	0	3.43	8.75	65.30	36.90	46.45	0.490	0.320	0.190
	20	3.63	10.00	68.60	47.50	48.35	0.675	0.400	0.225
	40	3.59	9.55	49.45	39.30	49.15	0.470	0.315	0.150
	60	3.52	10.00	53.65	39.85	46.45	0.625	0.425	0.205
Poplin	0	4.63	11.90	115.90	48.10	87.50	0.490	0.400	0.215
	20	4.87	13.95	118.60	60.50	77.65	0.670	0.430	0.245
	40	4.77	13.15	107.10	53.10	62.95	0.570	0.350	0.135
	60	4.66	14.50	92.85	48.60	65.35	0.685	0.450	0.215
Suiting	0	5.50	14.75	64.65	67.65	62.35	0.370	0.520	0.230
	20	5.60	17.00	55.35	59.00	66.00	0.440	0.550	0.308
	40	5.56	16.60	46.40	54.60	62.85	0.465	0.475	0.250
	60	5.39	16.60	45.20	48.40	50.75	0.375	0.485	0.245
Jean	0	5.40	14.15	83.85	54.70	97.80	0.450	0.440	0.270
	20	5.59	16.20	72.20	59.70	79.50	0.590	0.475	0.330
	40	5.48	15.90	65.45	53.25	68.85	0.550	0.545	0.240
	60	5.38	15.30	51.75	52.20	65.60	0.470	0.435	0.260

* Elongation values are given in inches to facilitate calculations, since all breaking elongation values are based on a 3-inch gauge length.

it was low in warpwise fabric breaking strength, second lowest in bursting strength, and highest in fillingwise breaking strength. At the same time the poplin, which was intermediate in weight and thickness and number of warps per inch, was low in number of fillings per inch, intermediate in size of yarns and in yarn strength, had the greatest warpwise fabric strength, and was second lowest in fillingwise strength and second highest in bursting strength.

The five subjects, chosen at random, were accepted as typical doctors' attendants. Since all of these women participated in essentially the same daily activities, and since their uniforms were identical in construction and fabric, mean values for the five garments have been used to show the effects of service. This procedure has been validated by the experimental findings since, although some significant differences between wearers were shown, generally such differences were accountable for little or no more variation than was observed within the fabrics themselves.

Differences among fabrics due to wear and/or laundering. Throughout the experiment, both without (table 2) and with wear (table 3), the suiting and jean were similar in *weight* and were the heaviest of the four fabrics. The poplin had an intermediate position, and the broadcloth was the lightest of the four. With laundering alone weight tended to increase in all cases during the first 20 launderings and to decrease thereafter. These initial increases doubtless were associated with shrinkage. The final values after 60 launderings were not very different from those recorded for the new materials. When wear was combined with washing, initial increases in weight were observed for the broadcloth and poplin, but the suiting and jean decreased in weight throughout the whole experiment.

The four materials held the same relative position for *thickness* as for weight. The shrinkage which occurred during the first few washings could have been due to the release of tensions in the new cloth and also to differences between the pressure applied in calendering and that used during ironing. Variations in thickness which were observed thereafter were small, both for the fabrics which were laundered only and those which were worn and laundered.

Changes in breaking strength, both warpwise and fillingwise, accompanied both laundering and wear in the four fabrics. As laundering with wear increased, decreases were more marked warpwise than fillingwise, and some changes in the relative position of the four fabrics occurred. The poplin was outstandingly stronger warpwise than any of the other three materials after each experimental period following laundering both without and with wear. With one exception, jean, although considerably weaker than the poplin, ranked second in warpwise strength under both of these conditions. At the same time, while the suiting and broad-

TABLE 3

The effect of increasing wear and laundering with starching on the four fabrics studied

FABRIC	NUMBER OF DAYS OF WEAR AND OF LAUNDERINGS	FABRIC PROPERTIES							
		Weight in Ounces per Square Yard	Thickness in 1/1,000 Inch	Fabric Breaking Strength (Grab) in Pounds		Bursting Strength in Pounds	Fabric Elongation (Grab)* in Inches		Bursting Elongation* in Inches
				Warpwise	Fillingwise		Warpwise	Fillingwise	
Broadcloth	0	3.43	8.75	65.30	36.90	46.45	0.490	0.320	0.190
	20	3.54	9.40	58.68	38.19	40.42	0.476	0.302	0.190
	40	3.64	9.44	33.98	27.03	33.82	0.371	0.292	0.166
	60	3.35	9.40	19.71	14.60	29.40	0.524	0.340	0.175
Poplin	0	4.63	11.90	115.90	48.10	87.50	0.490	0.400	0.215
	20	4.70	12.86	105.82	50.74	73.93	0.493	0.365	0.253
	40	4.69	13.35	71.48	39.25	58.80	0.423	0.326	0.241
	60	4.49	12.70	65.53	37.29	47.91	0.464	0.351	0.206
Suiting	0	5.50	14.75	64.65	67.65	62.35	0.370	0.520	0.230
	20	5.36	16.42	47.88	49.00	55.48	0.374	0.482	0.212
	40	5.18	16.86	39.22	40.08	43.46	0.338	0.416	0.173
	60	4.94	16.40	28.96	28.65	28.45	0.316	0.443	0.148
Jean	0	5.49	14.15	83.85	54.70	97.80	0.450	0.440	0.270
	20	5.26	16.08	65.49	47.38	65.31	0.536	0.354	0.225
	40	5.14	15.70	52.71	42.07	53.16	0.476	0.325	0.186
	60	4.85	15.24	38.16	33.55	38.20	0.451	0.366	0.137

* Elongation values are given in inches to facilitate calculations, since all breaking elongation values are based on a 3-inch gauge length.

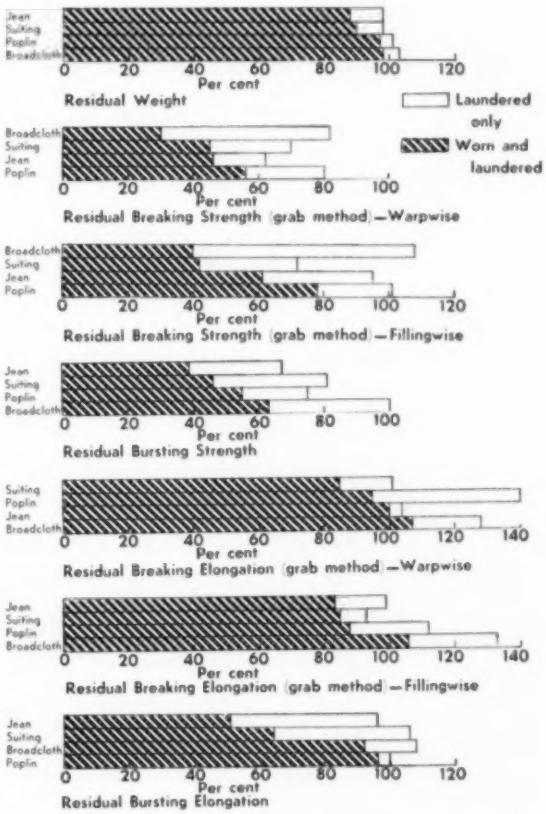
cloth were comparable in warpwise strength at the beginning of the experiment, with laundering alone suiting was consistently weaker than broadcloth. The relative position of these two fabrics when worn and laundered was reversed during the second period. The rate of decrease in strength due to successive launderings was less rapid than that due to wear plus laundering. Fillingwise the broadcloth was consistently weaker than the other three fabrics, which were quite similar in strength after the first few washings both without and with wear. Fillingwise strength after 20, 40, and 60 washings without wear was greater and decreased less rapidly as laundering increased than it did for fabrics which had been subjected to wear. Although the broadcloth, poplin, and jean were stronger after 20 launderings than when new, which increases may have been due to shrinkage, the suiting, outstandingly strong when new, showed a marked decrease in fillingwise strength after the first 20 launderings.

The bursting strength of the broadcloth was lowest and that of the suiting second lowest, both without and with wear. While the jean, throughout the whole experiment, was a little stronger than the poplin after laundering only, wear added to laundering resulted in poplin being stronger and jean second strongest after each successive period. Increasing wear with laundering caused marked and consistent decreases in bursting strength for all four fabrics. After laundering alone, decreases were observed throughout for the jean, through the fortieth washing for the poplin, after the twentieth washing for the suiting, and not at all for the broadcloth.

Elongation under stress varied throughout the study. *Under breaking forces* the suiting was consistently lowest in warpwise elongation both without and with wear; the poplin was highest without wear. Fillingwise the elongation of the broadcloth was lowest; that of the poplin tended to be somewhat low; and that for the suiting tended to be high, both without and with wear. Elongation values for fabrics laundered only were higher than those for fabrics which had been worn and laundered, and no general trend appeared to be associated with increased numbers of launderings. Elongation *under bursting forces* was not very different for the poplin and broadcloth when new and after wear, but these values for the jean and suiting tended to decrease with increasing wear and laundering. After 20, 40, and 60 launderings without wear, values for the poplin and broadcloth tended to be similar and lower than those for jean and suiting, which likewise were similar. Also after laundering alone, bursting elongation appeared to increase somewhat during the first few washings and to decrease between the 20th and 40th launderings. At the end of the experiment, values for this property were very nearly equal to those for the new cotton uniform fabrics.

Changes due to laundering without and with wear. Relative effects of laundering and of wear have been shown for certain fabric properties as residual values, expressed as a percentage of the values for the new materials. For all four fabrics, laundering alone 60 times caused less damage than did laundering combined with wear as shown by residual weight, strength, and elongation.

The effect on these four fabrics of laundering alone, as evidenced by the proportions of the properties which were retained after laundering, is shown in the chart. From this it can be seen that, with the exception of bursting strength and elongation, broadcloth and poplin suffered relatively



RESIDUAL VALUES, IN PER CENT, BASED ON DATA FOR NEW MATERIALS, FOR FABRICS WORN AND LAUNDERED 60 TIMES COMPARED WITH FABRICS LAUNDERED ONLY

smaller losses due to the laundering process when repeated 60 times than did suiting and jean. Aside from warpwise breaking elongation, broadcloth would place first on this basis, while jean would place last in the case of four properties measured. At the same time it should be noted that, based on the actual values for the new materials, broadcloth was low in many cases while jean was high. It has been pointed out that shrinkage which resulted from laundering could account for the increases observed in weight and fillingwise breaking strength of the poplin and broadcloth, for which the residual values were in excess of 100 per cent. Similarly, values for residual elongation in some cases tended to exceed 100 per cent after laundering alone.

Residual values did not follow the same pattern after laundering with wear (see chart). When wear was combined with laundering, poplin and jean retained larger proportions of their original breaking strength after 60 days than did broadcloth and suiting, while broadcloth retained the greatest proportion of its bursting strength. Based on strength, therefore, poplin ranked first among the four fabrics. Only the broadcloth, after wear with laundering, elongated more than did the new materials.

A comparison of the residual values recorded after laundering alone with those observed after laundering with wear gives some indication of the losses attributable separately to laundering and to wear. Laundering losses were smaller than wear losses in nine cases: weight for jean and suiting, warpwise breaking strength for broadcloth and fillingwise strength for jean, bursting strength for broadcloth and suiting, fillingwise breaking elongation for jean, bursting elongation for poplin and jean. In six cases, laundering losses were essentially equal to wear losses: warpwise breaking strength for poplin and suiting, fillingwise strength for suiting, bursting strength for poplin and jean, fillingwise breaking elongation for suiting.

Laundering alone caused gains as opposed to losses resulting from wear in the warpwise breaking elongation of all four fabrics and in the fillingwise elongation of broadcloth and poplin. Other gains due to laundering were equalled or exceeded by losses due to wear in the weight of broadcloth and poplin, in the fillingwise breaking strength of broadcloth and poplin, and in bursting elongation of broadcloth and suiting. Only in the warpwise breaking strength of the jean was loss from laundering appreciably greater than that attributable to wear.

According to this comparison of residual values, wear was markedly detrimental to the properties of these fabrics, from 2 to 37 times as harmful as laundering in the 9 cases where both factors caused losses. Nearly a fourth of all comparisons reported showed that laundering alone caused increases rather than decreases in the properties measured. It is apparent that the relative proportion of any one of these properties which will be retained after repeated laundering with or without wear will depend essentially upon the construction of the fabric rather than upon the property measured.

Summary. One piece each of broadcloth, poplin, suiting, and jean, of good quality, were studied after three periods of laundering without and with wear. A portion of these materials was made into uniforms which were worn by five women who were accepted as typical doctors' attendants. Both uniforms and control materials were subjected to the same laundry procedures. Values for weight, thickness, breaking and bursting strength, and elongation under breaking and bursting forces have been compared for the new materials and for materials subjected to 20, 40, and 60 launderings without and with wear. Residual values for fabric properties, expressed as percentages of values for the new materials, have been used to indicate the relative losses which may be attributed to laundering and to wear. This comparison has shown that, where both factors resulted in losses, the detrimental effect of wear was two or more times as great as that attributable to laundering, while laundering alone resulted in some increases in weight, breaking strength, and elongation. In only one case was the loss due to laundering appreciably greater than that attributable to wear. The differences among the fabrics studied were not uniform since the effects of wear and of laundering, as indicated by the measurements reported, varied for all four fabrics. The relative proportion of any one fabric property which will be retained after washing and wear apparently will depend upon the construction of the fabric more than upon the property measured.

References

1. Harwood, F. C. The wearability of fabrics. A comment from the point of view of the launderer. *J. Textile Inst.* **28** (1937), pp. P200-P201.
2. Phelps, E. L., McLean, F. P., Moore, M. M., Greenwood, L. S., Very, J., Holm, N. H., and White, V. The relative serviceability of four types of cotton fabrics when used for uniforms. *J. Home Econ.* **43** (1951), pp. 788-793.
3. ASTM Committee D-13 on Textile Materials. *ASTM Standards on Textile Materials.* Philadelphia: American Society for Testing Materials, 1950.

Mothers who are looking for guidance in the selection of the preschool child's wardrobe will find helpful suggestions in this report based on a study in one Virginia community. Teachers can use these data for discussion and for comparisons with the clothing of groups of children in other parts of the country. Manufacturers will find this report helpful in their efforts to place on the market better quality and more suitable children's clothing.

A Study of the Preschool Child's Clothing in 100 Families of Radford, Virginia

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CLOTHING the preschool child is a major problem for many families in the United States. Prices of children's clothing are very high, and the type of garment on the market often is unsuitable for the wear given it. Furthermore, it often does not meet the needs of growing children. The published literature on children's clothing reveals little about how parents buy clothing for the preschool child, what their preferences in style and fiber are, or how much they pay for the clothing.

This study purposed to gain information regarding the actual practices and preferences of the homemaker in relation to clothing the preschool child (1) to determine the amount, type, fiber content, and yearly cost outlay of clothing owned by the preschool child and (2) to ascertain the buying practices and preferences of the homemaker for style and fiber in the garments.

The data were obtained by personal interviews during April and May of 1949 with 100 white families living in Radford, Virginia, a city of 11,000 population. Radford is considered a small industrial city as it contains 8 to 10 small factories or industries employing from 25 to 1,000 persons each. Also located within the city is a small woman's college established in 1913.

The families in the study were a 25 per cent random sample of the white families having children between the ages of two and five years, living within the city limits. The 1948 income of these families ranged from $228 to $10,000 with the medium income falling between $3,000 and $4,000. The number of children in these families ranged from one to nine with an average of 2.6. There were 105 preschool children, 48 boys and 57 girls, between two and five years in these 100 families.

The education of the parents ranged from those with no formal schooling to college graduates. Of the total group of parents, 5.5 per cent had gone to fifth grade or less, 31 per cent had gone as far as the sixth or seventh, 45 per cent had attended high school, and 17.5 per cent had attended or been graduated from college, while the education of 1 per cent was unknown. The education of these parents was slightly higher than that for Virginia as a whole.

Wardrobe of the Preschool Child

The preschool children in this study had on the average 61.7 items in their wardrobes valued at $118.01. The preschool children in the lowest income group ($2,000 or less) had 41.1 items in their wardrobes valued at $74.99 while those in the highest income group ($4,000 and over) had 75.0 items valued at $178.75. The average preschool girl had a few more items of clothing than had the boys, 65.1 as compared to 57.7 items, and her clothes cost slightly more (tables 1 and 2).

There was no consistent variation in the number of garments owned by preschool children from one level of income to another. For example, the average child in the lowest income group had 1.8 pairs of shoes while in the highest he owned 2.5 pairs. For socks these figures were 8.3 and 9.6, respectively. The child in the lowest income group had 6.1 pairs of shorts as compared to 12.8 in the

TABLE 1

Average and range in number and price of garments in the preschool child's wardrobe

GARMENT	NUMBER OF GARMENTS		COST OF GARMENTS	
	Average	Range	Average	Range
1-piece underwear	0.3	0 to 6	$ 1.05	$0.59 to $1.98
Panties and shorts	9.6	0 to 48	0.42	0.16 to 0.75
Undershirts	4.0	0 to 16	0.50	0.25 to 0.98
Slips*	4.9	0 to 15	0.93	0.39 to 2.25
Pajamas	2.8	0 to 10	1.74	0.65 to 3.50
Gowns*	1.0	0 to 8	1.56	0.79 to 3.98
Bathrobes	0.6	0 to 2	3.88	2.00 to 6.00
Light-weight coats	0.6	0 to 2	9.82	4.50 to 22.50
Heavy coats	0.9	0 to 3	15.74	5.00 to 39.95
Raincoats	0.1	0 to 2	3.56	0.98 to 10.00
Headwear	2.6	0 to 10	1.61	0.50 to 5.00
Sweater	2.7	0 to 7	2.85	1.00 to 4.50
Jacket	0.5	0 to 3	3.99	1.19 to 6.00
Snow suit	0.5	0 to 2	11.64	3.00 to 17.95
Suits	1.4	0 to 13	4.55	1.50 to 13.00
Shirts and pants	2.0	0 to 12	3.10	1.00 to 5.30
Blouses and skirts*	4.0	0 to 16	1.19	0.39 to 2.98
Coveralls and overalls	3.0	0 to 12	2.00	0.79 to 3.98
Dresses*	10.2	0 to 20	3.23	1.70 to 8.00
Sun and bathing suits	3.0	0 to 15	1.57	0.79 to 4.00
Socks	8.9	3 to 36	0.31	0.08 to 0.49
Shoes	2.3	1 to 5	4.32	1.98 to 7.00
Boots and galoshes	0.1	0 to 1	2.58	1.98 to 2.98
Gloves	1.1	0 to 4	0.88	0.48 to 2.00
Bedroom shoes	0.5	0 to 2	1.68	0.98 to 2.98
Purses	1.4	0 to 4	0.91	0.17 to 2.00
Jewelry	1.0	0 to 12	3.90	1.00 to 8.50
Hair ribbons*	0.4	0 to 20	—	0.03 to .25
Average total	61.7		$118.01	

* Girls only.

highest income group. When little girls' slips were compared, the lowest income group had nearly twice as many per child as the highest group.

The cost of clothing children was much more of a burden for the low-income groups than for the higher ones. It will be noted in table 2 that the number of children per family had a tendency to increase as the income decreased. The families with incomes of under $2,000 averaged 3.3 children as compared to 2.5 for the families with incomes of $4,000 and over. If the cost of the preschool child's clothing is representative of clothing costs for children, the value of the clothing for the children represents 19.8 per cent of the yearly income for the families with incomes under $2,000 as compared to 7.1 per cent in the highest income group.[1]

TABLE 2

Number of children and cost of preschool children's wardrobes in relation to family income

INCOME GROUP	NUMBER OF CHILDREN IN FAMILY		AVERAGE VALUE OF PRESCHOOL CHILD'S WARDROBE	ESTIMATED VALUE FOR ALL CHILDREN	PER CENT OF MEAN INCOME*
	Range	Average			
Under $2,000	1 to 7	3.3	$74.99	$250.00	19.8
$2,000 and under $3,000	1 to 9	2.6	104.22	270.97	10.8
$3,000 and under $4,000	1 to 7	2.3	111.22	255.81	7.3
$4,000 and over	1 to 6	2.5	178.75	446.90	7.1
Total	1 to 9	2.6	118.01	306.83	9.1

* The mean incomes for the four income levels were as follows:
Under $2,000—$1,250
$2,000 and under $3,000—$2,500
$3,000 and under $4,000—$3,500
$4,000 and over—$6,300

Source of and Fiber Content in Garments

Approximately 75 per cent of the garments found in the preschool child's wardrobe were purchased ready-made by the mother, 12.4 per cent were homemade, while 11 per cent were gifts, and 3.2 per cent were hand-me-downs.

Garments most frequently constructed at home were gowns, slips, and dresses for little girls and bathing and sun suits for little boys. Only in the case of gowns and slips were as many as half constructed at home.

In table 3 it will be noted that 76.3 per cent of all items found in these preschool children's wardrobes were made of cotton with only 3.6 per cent made of rayon. More than 90 per cent of the following garments were made of cotton: one-piece underwear and undershirts, overalls and coveralls, pajamas, gowns, blouses and shirts, dresses, bathing and sun suits, and socks. Girls' slips and panties were the only items in which more than 10 per cent were constructed of rayon. Heavy coats, light-weight coats, and sweaters usually were made of wool.

Buying Practices of the Homemakers

Whatever the size of the homemaker's income, she likes to get full value for the price she pays. This value depends upon where, when, and how she shops; her understanding of what and how much she can expect for the price she is able to pay and what to look for when judging quality in clothing.

Department stores were patronized by practically all of the homemakers; however, mail ordering and purchasing at the 5 and 10 cent stores were practices of 51 per cent and 41 per cent of the homemakers, respectively. Clothing for girls was obtained more frequently at the 5 and 10 than was

[1] Not all of the children's clothing is purchased new each year; however, the mothers reported little carry-over from one year to another.

clothing for boys.[2] Nearly one-fourth, 23.3 per cent, of the homemakers purchased some children's clothing, predominately shoes, at specialty shops.

irrespective of income. In the lowest income group only 16.7 per cent of the homemakers mended children's clothes while those with an income of $3,000

TABLE 3

Source of garments and fiber content in children's wardrobes

GARMENT	SOURCE OF GARMENTS				FIBER CONTENT				TOTAL NUMBER OF ITEMS
	Home-made	Handed Down	Gift	Ready-made	Cotton	Rayon	Wool	Other*	
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	
1-piece underwear	0	20.6	0	79.4	100.0	—	—	—	34
Panties and shorts	2.9	0	2.2	94.9	87.9	12.1	—	—	1010
Undershirts	3.1	2.4	4.5	90.0	98.8	1.2	—	—	419
Slips†	49.9	0.7	7.9	41.5	86.6	13.4	—	—	277
Pajamas	25.3	2.7	7.8	64.2	93.2	6.8	—	—	296
Gowns†	63.1	0	1.8	35.1	96.9	3.1	—	—	57
Bathrobes	19.4	11.3	33.9	35.4	74.2	3.2	21.0	1.6	62
Light coats	28.6	9.5	6.3	55.6	9.5	—	76.2	14.3	63
Heavy coats	13.3	7.8	11.1	67.8	2.2	—	93.4	4.4	90
Raincoats	0	6.6	26.7	66.7	73.3	—	—	26.7	15
Headwear	6.9	4.4	12.7	76.0	27.6	1.4	61.8	11.0	275
Sweaters	3.2	8.8	18.0	70.0	13.8	—	84.1	2.1	283
Jackets	7.7	13.5	9.6	69.2	71.2	—	26.9	1.9	52
Snow suits	4.0	8.2	8.2	79.6	55.1	—	44.9	—	149
Suits	15.9	5.9	16.6	61.6	71.5	7.3	20.5	0.1	151
Shirts and trousers	11.3	8.0	15.1	65.6	59.0	0.4	40.6	—	212
Blouses and skirts†	3.6	4.8	17.1	74.5	99.3	0.7	—	—	420
Overalls and coveralls	6.8	2.3	10.0	80.9	100.0	—	—	—	310
Dresses†	38.0	5.0	10.1	46.9	95.7	4.3	0.02	—	584
Bathing and sun suits	40.1	4.4	14.5	41.0	96.5	1.0	2.5	—	317
Socks	0	0	7.5	92.5	100.0	—	—	—	937
Shoes	0	0.4	3.4	96.2	—	—	—	100.0	237
Boots and galoshes	0	11.1	22.2	66.7	—	—	—	100.0	9
Gloves	3.4	4.3	29.7	62.6	34.8	—	60.0	5.2	115
Bedroom shoes	2.0	4.1	24.5	69.4	20.4	—	51.0	28.6	49
Purses	4.0	5.4	43.2	47.4	5.4	—	—	94.6	74
Jewelry	0	0	75.5	24.5	—	—	—	100.0	110
Per cent of total items	12.4	3.2	11.0	73.4	76.3	3.6	12.4	7.7	

* Other includes wool mixtures, straw, silk, linen, plastic, leather, rubber, fur, sterling silver, and gold plate.
† Percentages figured for the girls only.

It is generally assumed that the consumer who has a buying plan is more likely to buy seasonally than as needed. Taking advantage of seasonal sales, buying soiled garments that can easily be washed or cleaned, making over garments, and in some cases buying irregulars are generally accepted as money-saving practices. On the whole, the homemakers in this study did not have clothing plans. Those in the highest income group more frequently bought seasonally than did those in the lowest; however, those in the lowest income group more frequently took advantage of money-saving practices.

According to the statements of these homemakers, little mending of children's clothing was being done

[2] The items most often bought at the 5 and 10 cent stores were socks, panties, gloves, purses, headwear, and hair ribbons. The reasons given by the homemakers for 5 and 10 cent store shopping were the wide range in style and price and the ease of shopping in such stores.

or over never made a practice of mending children's clothes. The little mending being done seems inconceivable, but some mothers gave as an explanation that their children grew out of the clothing before it needed repair. Also, it is possible that the upper income groups were buying better clothing that would not require so much mending as that bought by the lower income groups. Judging by the responses of the homemakers one may question whether they knew how to mend satisfactorily.

Buying children's clothes at sales was not a customary practice of these homemakers. Less than half listed any garments as bought at sales. The homemakers gave the following reasons for not patronizing sales: did not have the money to invest in garments that were not needed immediately; had to arrange their shopping time when they had someone with whom to leave children, which oftentimes did not coincide with the sales; did not know quality well enough to risk buying at sales.

Knowledge of Labels

For years home economists have advocated that garments be labeled in such a way that the homemaker can understand what she is purchasing. Before labeling can be improved, two questions must be answered: to what extent does the homemaker read and understand what is placed on labels, and does the label carry the information desired or required for good buying? If verbal expression can be accepted at face value, one must conclude that the women in this study read labels. Seventy-four per cent said that they usually read what is on the label when buying children's clothing. When the homemakers were questioned concerning what a label is, only 11 per cent had a good knowledge and 31 per cent a fair knowledge of what a label consists. On the whole homemakers with more education had a better knowledge of what constitutes a good label [3] than had the others. Also those with home economics training had a better understanding than those without this training. The homemakers in the two higher income groups had a better knowledge of labels than had those in the two lower income groups, but knowledge of labels did not increase consistently with income.

In order to check further the homemakers' knowledge of labels, they were asked to define certain terms commonly found on labels, such as water-repellent, Sanforized, Sanforset, thread count, and re-used wool. The understanding of the label terms by homemakers is shown in chart 1. The only item which as many as half of the homemakers could define correctly was waterproof; however, 43 per cent had a good knowledge of what water-repellent and re-used wool mean. Less than 5 per cent knew the meaning of such terms as virgin wool, reprocessed wool, Sanforset, and FTC rulings. The homemakers' knowledge of label terms tended to increase as their general education increased.

In ascertaining what label information was desired by the homemaker she was asked to pick from a list of eight items the five she preferred on labels. The information most wanted on labels by these homemakers was colorfastness, amount of shrinkage, and washing directions. These items were considered more important by the homemakers without home economics instruction than by those with home economics instruction; however, the difference was not statistically significant (chart 2).

The homemakers were least interested in knowing the thread count and the name of the manufacturer. More than half, 62 per cent, of the homemakers wanted the garment size in measurements, as compared to 42 per cent who preferred it in age. Only 4 per cent wanted the garments labeled both in age and measurement size. As education and income increased, the number of homemakers preferring garments sized by measurements increased.

During the past few years extensive research has been carried on by the National Bureau of Standards in ascertaining measurements of children in relation to age. Findings in this study indicate that an extensive educational program needs to be carried on to encourage homemakers to accept and make use of the new type of size.

"Self-Help" Garments

This study indicates that homemakers are not

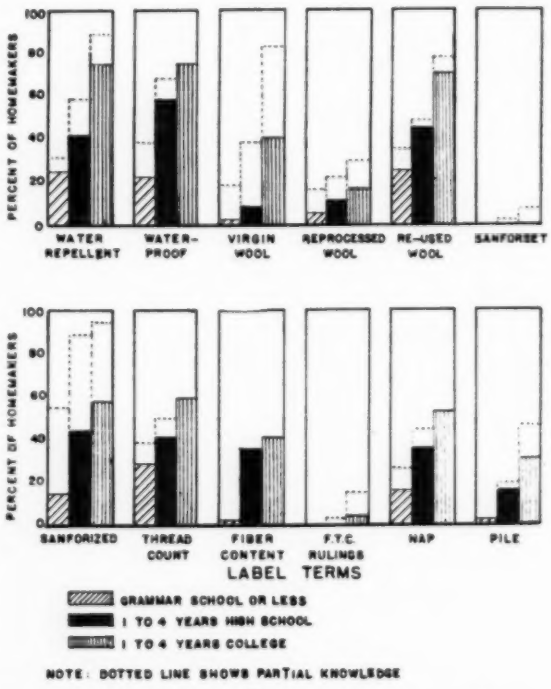


CHART 1. HOMEMAKERS' KNOWLEDGE OF LABEL TERMS IN RELATION TO EDUCATION

[3] The National Consumer-Retailer Council defines a good label as follows: The purpose of an informative label is to enable the consumer to buy wisely and the store to sell intelligently, to the end that the consumer gets the maximum satisfaction for the money expended and the store handles the transaction with the minimum possibility for returns and adjustment. An informative label should give the consumer a definite idea of the quality of the product by telling its composition and construction, what it will do, how to use it, and how to care for it—as a basis for intelligent choice, and to enable her to compare qualities. A definite idea can only be conveyed by specific facts.—Informative Labeling by Roger Wolcott—For the Labeling Committee of National Consumer-Retailer Council, Inc., p. 14.

aware of "self-help" features on children's garments. Of the 100 homemakers in the study, 67 per cent had no knowledge of what "self-help" means. The homemakers who were familiar with self-help bought garments with this feature. Undoubtedly more must be done to acquaint the homemaker with these garments which supposedly save time and help in the training of the child, if homemakers are to purchase garments with this feature.

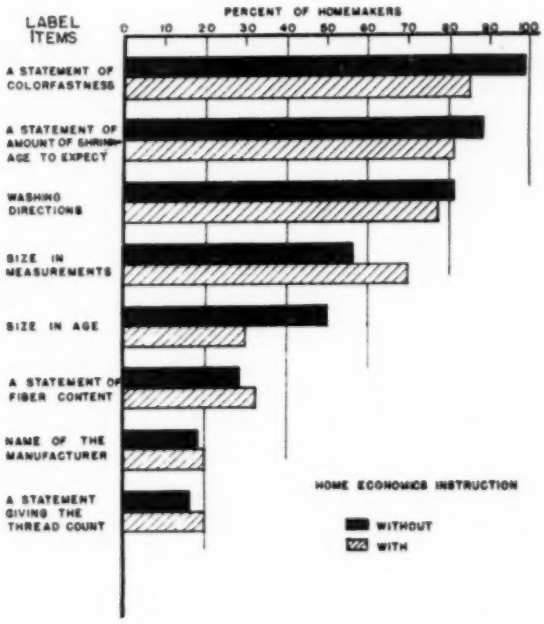

LABEL ITEMS
PERCENT OF HOMEMAKERS
0 10 20 30 40 50 60 70 80 90 100
A STATEMENT OF COLORFASTNESS
A STATEMENT OF AMOUNT OF SHRINKAGE TO EXPECT
WASHING DIRECTIONS
SIZE IN MEASUREMENTS
SIZE IN AGE
A STATEMENT OF FIBER CONTENT
NAME OF THE MANUFACTURER
A STATEMENT GIVING THE THREAD COUNT
HOME ECONOMICS INSTRUCTION
WITHOUT
WITH

CHART 2. LABEL INFORMATION WANTED BY HOMEMAKERS IN RELATION TO HOME ECONOMICS INSTRUCTION

Selection Factors in Buying

The homemakers in this study seldom bought children's clothing by brand name. Of all items in the survey, shoes were most commonly bought by brand name. Fifty-two per cent of the homemakers bought shoes by brand name, 33 per cent bought dresses, 20 per cent undergarments, and 16 per cent bought overalls by brand name. Purchase by brand name was below 10 per cent for all other items. The homemakers of the highest income group and those with more formal education had a greater tendency to buy by brand name. Homemakers with home economics instruction, however, bought less frequently by brand name than did those who had no such training. The only advantage cited by these homemakers for buying by brand name was that if they purchased a garment which gave satisfaction they felt safer in buying the same garment again. On the whole these homemakers knew few brand names [4] and sought a type of garment when shopping rather than a brand name of garment.

Buying

Factors which should be considered when purchasing children's clothing seemed fairly well crystallized in the minds of these homemakers. Out of a list of nine factors these homemakers placed durability first and price second in importance. In Chart 3 the ranking of the factors relative to the education of the homemaker is shown. The importance of the selection factors was similar for all homemakers irrespective of income.

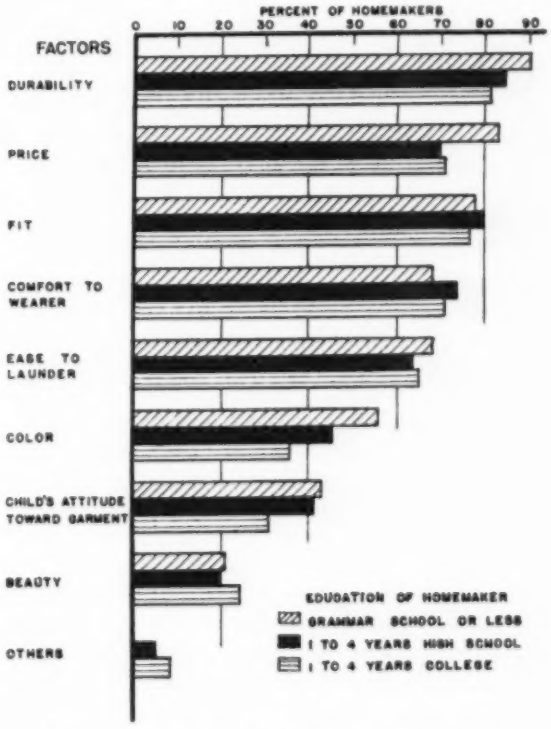


CHART 3. FACTORS CONSIDERED IMPORTANT BY HOMEMAKERS IN SELECTING CHILDREN'S CLOTHING

Sewing Practices

Girls' clothing was made at home more frequently than was boys'. Only 14.9 per cent of the mothers did most of the sewing for their preschool sons, while 50.7 per cent of the mothers made most of their daughters' clothes. The per cent of home-

[4] Of 18 common brand names only 10 per cent of the homemakers knew or used as many as one-sixth of them.

makers who made some or most of their preschool children's clothing increased consistently with education. The reasons given by the homemakers for making or for not making their preschool children's clothing are listed below:

REASONS FOR MAKING CHILDREN'S CLOTHING	PER CENT OF HOMEMAKERS	REASONS FOR NOT MAKING CHILDREN'S CLOTHES	PER CENT OF HOMEMAKERS
Saving of money	80.1	Inability to sew	40.0
Desire to sew	47.9	Dissatisfaction with fit or appearance of homemade garments	29.6
Get better fit	45.1	Saving of time	15.2
To get exact article needed	16.9	Lack of sewing machine	12.2
To use material on hand	5.6	Dislike of sewing	10.5
Other reasons	18.6	Saving of money	5.9
		Other reasons	17.7

Preferences of the Homemaker

These data indicate that homemakers purchase the type of child's clothing that they like or prefer. No doubt statements of preference are biased by the person's lack of knowledge of possibilities. For example, when the homemakers were asked if they preferred 1-, 2-, or 3-piece pajamas many answered, "I never heard of 3-piece pajamas before." When the 3-piece type was explained to the homemakers, several said that it sounded like a good idea, but since they had never tried them they would still say they preferred 1 or 2 pieces as the case may have been. In table 4 the types of garments favored by the homemaker for the preschool child's wardrobe are shown. Generally they purchased and preferred panties with elastic all around, slip-on shirts, wrap and tie bathrobes, front button sweaters, two-piece snow suits, one-piece bathing and sun suits, short socks, lace shoes, and front opening dresses.

These homemakers were quite definite as to their preferences for fabrics for children's clothing. In table 5 the materials considered most suitable for girls' and boys' clothing are shown. Cotton print, gingham, and broadcloth were the most popular all-round materials for girls' dresses, while cotton twill, denim, and corduroy were fabrics most often preferred for boys' suits. For both boys and girls, wool was twice as popular for coats as was any other material.

Clothing Changes Desired

If children's clothing is to be improved, the changes desired by homemakers, or the points at which clothing fails to give satisfaction, must be made known to the manufacturers and retailers of children's clothing. It can be seen in table 6 that the change desired by the largest number of homemakers was for more durable and better constructed garments in the lower and moderate price line.

TABLE 4

Per cent of mothers owning and preferring various types of children's clothing

TYPES OF GARMENTS	GARMENTS OWNED *	GARMENTS PREFERRED †	TYPES OF GARMENTS	GARMENTS OWNED *	GARMENTS PREFERRED †
	per cent	*per cent*		*per cent*	*per cent*
Shorts and panties			Skirts		
Elastic all around	77	72	Pleated	14	10
Elastic half around	24	19	Gathered	5	3
Underwear shirts			Pants		
Slip-on	64	56	Long	20	11
Lap and pin, tie or sew	17	16	Short	21	13
Button	7	6	Blouses or skirts		
Slips			Slip-on	34	30
Slip-on	43	41	Button	28	23
Shoulder button	12	8	Grippers	5	2
Pajamas			Overalls		
One-piece	43	34	Dungarees (strap arrangement)	4	4
Two-piece	46	38	Buttonhole	1	3
Three-piece	7	9	Loop	1	2
Bathrobes			Built-up	22	20
Wrap and tie	44	46	Criss-cross	63	56
Button	10	8	Dresses		
Light coats			Back opening	42	37
Single-breasted	25	26	Front opening	14	13
Double-breasted	28	27	Bathing and sun-suits		
Cape	3	3	One-piece	51	49
Heavy coat			Two-piece	12	8
Single-breasted	45	39	Socks		
Double-breasted	39	42	Short	100	100
Sweaters			Long	1	0
Button	72	65	Shoes		
Slip-on	38	25	Sandals	28	10
Jackets			Low buckle	30	18
Button	20	16	High lace	51	30
Zip	12	13	Boots	4	3
Snow suits			Gloves		
One-piece	19	17	Gloves	30	28
Two-piece	24	23	Mittens	44	39
Two-piece suits					
Front button	43	42			
Front zip	2	1			
Jerkin or slip-on	4	3			

* Some children owned garments of two or more styles.

† Some mothers had no preference as to type of garments.

The homemakers in the upper income group were more conscious of needed changes than were those in the lower, listing on an average 1.25 changes desired per person as compared to only 0.6 changes per person in the lowest income group. Thirty-four per cent of the homemakers had no changes to suggest.

Problems of Children's Clothing

All of the homemakers in the study had one or more fitting problems with their children's clothing. These problems were more often associated with

boys' clothing than with girls'. In table 7 it will be noted that the most frequent complaint was that the garments were too long.

TABLE 5

*Per cent of homemakers' preferring various fabrics for preschool children's clothes**

MATERIAL	WINTER		SUMMER	
	Everyday	Party	Everyday	Party
	per cent	*per cent*	*per cent*	*per cent*
For girls' clothes				
Cotton print	64.3	42.9	66.1	19.6
Gingham	55.3	28.6	41.1	5.4
Broadcloth	51.8	30.4	28.6	14.3
Organdy	0	3.6	8.9	60.7
Corduroy	44.6	19.6	3.6	1.8
Dimity	1.8	3.6	17.9	42.9
Rayon	3.6	35.7	5.4	14.3
Dotted Swiss	0	1.8	7.2	33.9
Crepe	1.4	14.3	1.8	10.7
Taffeta	0	17.9	0	5.4
Piqué	0	0	12.5	7.2
Velveteen	1.8	10.7	0	0
Wool	0	12.5	0	0
Others†	10.7	3.6	12.5	12.5
For boys' clothes				
Cotton twill	34.0	17.0	42.6	19.1
Denim	66.0	6.4	31.9	0
Corduroy	55.3	40.4	4.3	2.1
Gabardine	10.6	38.3	8.5	19.1
Chambray	14.9	10.6	23.4	19.1
Cotton suiting	4.3	2.1	14.9	25.5
Cotton jersey	12.8	10.6	8.5	10.6
Cord	6.4	2.1	8.5	2.1
Flannel	2.1	17.0	2.1	6.4
Indian Head	0	2.1	10.6	10.6
Covert	6.4	6.4	4.3	0
Seersucker	0	0	4.3	8.5
Broadcloth	0	0	6.4	6.4
Others‡	0	2.1	2.1	4.3

* There were 47 homemakers with preschool boys and 56 with preschool girls.

† This includes chambray, seersucker, voile, and cotton jersey.

‡ This includes poplin and crash.

The homemakers were more critical of the workmanship found on preschool children's clothing than of any other feature. Poor buttons and buttonholes, poor stitching, snaps and hooks not securely fastened were problems for them. The per cent of the homemakers listing each of these problems associated with garment construction is given below:

PROBLEM	PER CENT OF HOMEMAKERS
Buttons and buttonholes	69.0
Seams	59.0
Snaps and hooks	41.0
Hems	20.0
Applied decoration	26.0
Openings	20.0

The most common difficulty associated with fabric centered around laundering. As indicated below, 40 per cent of the homemakers had trouble with colors running and 35 per cent found garments hard to iron.

DIFFICULTY WITH GARMENT	PER CENT OF HOMEMAKERS
Colors run	40.0
Difficult to iron	35.0
Poor design	27.0
Poor washing qualities	22.0
Poor wearing qualities	26.0
Others	2.0

TABLE 6

Changes homemakers would like to see made in children's clothing

CHANGES DESIRED	HOMEMAKERS
	per cent
Sizes:	28 (total)
More clothes for boys aged 2 and 3	3
Sizes standardized	5
Sizes in measurements	2
Three sizes in each age group: tall and thin, average, short and plump	10
Shorter anklets for young preschool children	1
Sizes that fit with allowance for growth	7
Style:	24 (total)
More different styles for preschool girls	1
More different styles for preschool boys	5
More "self-help" on garments	9
Better designs for preschool girls	4
Overalls with reinforcements sewed on knees	1
Dress plackets inserted through waistline	2
Attractive sweaters made of a fiber other than wool	1
Garments made with an extra piece of material stitched on the inside for patching	1
Prices and durability:	44 (total)
Prices more in line with quality	28
"Let out" coats that are less expensive	2
More durable materials used	6
Stronger seams	6
More durable "dress clothes"	2

TABLE 7

Most common difficulties with fit of ready-made garments

DIFFICULTY OR COMPLAINT	HOMEMAKERS REGISTERING THE COMPLAINT	
	With Boys' Garments	With Girls' Garments
	per cent	*per cent*
Too long	46.7	39.3
No allowance for growth	34.0	30.4
Sleeves too long	29.8	8.9
Too large at shoulder	19.1	16.1
Too large at waist	19.1	12.5
Too large all over	12.8	16.1
Too short	10.6	17.8
Waist too long	10.6	14.3
Too small all over	6.4	12.5
Too small at shoulder	10.6	7.1
Too small at waist	6.4	8.9
Bands on sleeves too loose	4.3	10.7
Bands on sleeves too tight	4.3	10.7
Waist too short	8.5	3.6
Sleeves too short	8.5	1.7
Neck too small	4.3	5.4

The style feature least liked by mothers was colored trim on white garments. Homemakers stated that the color from the trim often ran onto the body of the garment and bleaching was impossible without spoiling the trim. Almost three-fourths of the mothers disliked puffed pockets on little girls' dresses. As some mothers stated, "There is just not an iron made that will iron those things." Most of the mothers liked gathers and ruffles but disliked rickrack as a trim.

STYLE FEATURES DISLIKED	PER CENT OF HOMEMAKERS
Colored trim on white garments	82.1
Puffed pockets	73.2
Rickrack	66.1
Ribbons	48.2
Small buttons	48.2
Pleats	37.5
Puffed sleeves	26.8
Lace	26.8
Ruffles	16.9
Gathers	6.9

In order to obtain further information on adequacy of children's clothing the homemakers were asked what they considered the major problems faced in clothing preschool children. Eighty-nine per cent of the mothers felt that children's clothing was too expensive, while more than half of the mothers felt that size in children's clothing "meant nothing" as a guide for buying. Other problems listed by a sizable group of the homemakers were as follows: Most attractive suits and dresses are hardest to iron (45 per cent of the homemakers), no allowance for growth (38 per cent), clothes hard to put on (15 per cent).

Although the women in this study complained bitterly about children's garments as a whole, only 34 per cent were able to list specific garments purchased during the last two years which had not given satisfaction. The homemakers in the two lowest income groups made only a third as many complaints about unsatisfactory garments as did those in the two highest income groups. Shoes gave the most dissatisfaction. Homemakers also complained that the hats and caps that came with coats and snow suits did not fit.

Few of the homemakers returned to the retailer garments that had not given satisfaction. The reasons for not returning the garments were: they felt unable to get an adjustment after the garment was worn, and the time and effort necessary to return the garment and go through the necessary procedure to apply for an adjustment were too great.

Summary

The preschool child's wardrobe averaged 61.7 items, valued at $118.01. Children in the income group of $2,000 or less averaged 41.1 items in their wardrobes valued at $74.99 while those in the income group of $4,000 and over had 75.0 items valued at $178.75. Most of the items in the preschool children's wardrobes were made of cotton. Coats, sweaters, and snow suits usually were made of wool.

Children's clothing on the whole was purchased at department stores with mail-order buying second in importance. It was not customary for these homemakers to have yearly buying plans, although this practice was more usual in the higher income groups than in the lower. Only the lowest income group used to any extent such money-saving devices as buying seconds, buying at sales, and buying soiled garments. Few of the homemakers had adequate information of label terms and little knowledge of brand names. These homemakers were more interested in the colorfastness of a garment than in any other label information. Each homemaker had an average of two or three complaints with the workmanship on ready-made garments. The chief complaints were poor quality and poorly sewed buttons, poor buttonholes, poor stitching, and seams that ripped and raveled. Fabrics presented fewer problems to the homemakers than did workmanship. The most common complaints on fabrics concerned colors' running and ironing difficulties.

The style features on children's clothing least liked were puffed sleeves and pockets, small buttons, colored trim on white garments, and rickrack trim.

The homemakers felt that the cost of children's clothing was unreasonably high, that sizes needed to be standardized, and that attractive styles that could be ironed easily should be made.

If these data are representative, homemakers need help in clothing the preschool child. They need more training for selecting children's clothing and more suitable children's clothing within a normal price range from which to select.

AHEA's Next President

A president-elect tops the list of AHEA officers to be elected this spring. Ballots go to all members at the end of this month. Return yours promptly.

Research workers often need to appraise the economic status of families for whom no satisfactory economic data are available. A scheme is here proposed for utilizing information on material possessions and social characteristics as indicators for approximating the economic status of farm families. Extension workers, too, will find this a useful concept.

Selected Indicators as Measures of Economic Status of Farm Families in the North Central Region[1]

Olga Pecheniuk and Margaret Liston

Miss Pecheniuk is instructor of home economics at Morehead State Teachers College in Kentucky. She completed the study from which this article has been developed as her master's thesis at the Iowa State College in June 1952. The study was made under the guidance of Dr. Liston, head of the department of home management.

SELECTED data from the 1948 survey of housing needs and preferences of farm families in the North Central Region[2] were used in the present study to explore a method of classifying farm families by economic status. "Economic status" was interpreted as the position of a family relative to other families in terms of (1) its current income or (2) its current material possessions or (3) both of these.

A completely satisfactory means of measuring the economic status of farm families probably will never be developed. The difficulties of identifying and measuring the components of economic status and the dynamic nature of these components are among the many problems involved. However, many researchers, educators, and government officials who are concerned with farm family welfare need some method of identifying farm families, at least approximately, in terms of relative economic position.

Until social scientists can develop ways of obtaining income information accurately and quickly, until they devise ways of obtaining income data over time so as to avoid the problem of year-to-year fluctuations, and until they can study much more thoroughly and extensively the relative adequacy of scales for measuring economic and social status, alternative methods of classification will be sought by investigators of farm family living.

Data from the North Central Region housing survey included many items which have been selected for economic and socioeconomic scales and information about other possible indicators of economic status.[3] Also, the data had been obtained from a representative sample of the families living in the open-country areas of the region. For these reasons they were used in the present study to seek answers to the following questions:

1. Of the possible indicators in the data available, which appear to be the better reflectors of economic status?
2. What differences occur in the classification of given families when income and selected economic characteristics are used as criteria of classification?
3. How do the characteristics of families and of their housing and possessions differ when the families are grouped as "low," "middle," and "high" by the different methods of classification?
4. Do the answers to the foregoing questions seem to justify further study of a proposed method of classifying farm families by broad economic groups?

Selection of Indicators

The selection of economic indicators was based on unpublished analyses made recently at Iowa State College. Data from the regional housing survey were used to identify certain material possessions and social characteristics as probable

[1] Journal Paper No. J-2187 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 933 (Revised).

[2] P. NICKELL, M. BUDOLFSON, M. LISTON, and E. WILLIS, Farm Family Housing Needs and Preferences in the North Central Region. North Central Regional Publication No. 20 (February 1951).

[3] For an interpretation of levels of living as revealed in the data of the farm housing survey in the Western Region, see "Construction of a Farm Family Level of Living Scale for 11 Western States" by VERNON DAVIES and ANNE L. WOOD, *J. Home Econ.* **43**, No. 2 (February 1951), pp. 109-112.

reflectors of economic status. By the chi-square technique, tests were made to determine whether the possession of each of 17 items or characteristics was associated significantly with the possession of each of the others. A chi-square value larger than that necessary to allow for sampling error represented association between the two indicators, and the larger the chi-square value the closer the association. Similarly, a relatively high sum of chi-square values for the association of a given indicator, say of running water, with each of the other assumed indicators, was interpreted as reflecting the probability that a family having that indicator would be more likely to possess the other items than would those without it.

By this method, 5 of the 17 factors studied previously were selected temporarily as among the better indicators of economic status of farm families in the North Central Region. These were dwellings with (1) six or more rooms, (2) running water, and (3) one or more bathrooms, and the possession of (4) a mechanical refrigerator and (5) a telephone. These five basic indicators were used for the first part of the present study. Later the number was expanded to the 12 indicators listed in the second footnote to table 1. Other items tested and rejected were ownership of the farm being operated, age of head, age of homemaker, head completed high school, homemaker completed high school, entertain farm and business groups in the home, entertain family groups in the home, one or less than a person per room in the house, and family size.

Methods of Classifying Families

In seeking answers to the second question, five methods of classifying families were studied.

1. Estimated family income
2. Five statistically selected economic indicators, unweighted
3. Five statistically selected economic indicators weighted by the technique used by Sewell and others
4. Five statistically selected economic indicators, each weighted in inverse ratio to its prevalence among all families in the sample
5. Twelve statistically selected economic indicators, unweighted

During the interviews, information about net family income was obtained by asking the respondents to indicate which of seven specified income groups best represented the family's net income. Data from only 865 households in the sample were used since 19 respondents did not give information about family income. In the present study the seven income groups were combined in three (table 1). About one-third of the respondents reported incomes of $1500 to $2,000. Almost one-third said that they had incomes under $1500, and slightly more than one-third indicated that their incomes were $3,000 or over.

Since Sewell and other investigators had used a special technique of weighting the indicators in inverse relation to their frequency in the population, this method was tried in the present study. To obtain the numerical credit which should be given a family for each indicator possessed, the percentage of families in the sample having the indicator was divided by two and then subtracted from 100. The sum of a family's credits for the indicators possessed represented its score. Families with scores of 87 or less were classified in the low group. Those with scores from 138 to 242 were placed in the middle group, and those with scores of 283 to 380 were classified as of relatively high status in light of the factors being considered. When scored by this method, each family's classi-

TABLE 1

Classification of families by selected indicators of economic status in relation to their classification by estimated income

ESTIMATED INCOME	FAMILIES		FAMILIES CLASSIFIED BY SELECTED INDICATORS OF ECONOMIC STATUS					
			Five Indicators*			Twelve Indicators†		
			Low (0,1)	Middle (2,3)	High (4,5)	Low (0 to 3)	Middle (4 to 7)	High (8 to 12)
	number	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
Under $1500	250	28.9	51.9	20.0	13.9	54.1	23.8	9.6
$1500 to $2,999	289	33.4	33.3	38.4	27.4	34.3	37.8	25.0
$3,000 and over	326	37.7	14.8	41.5	58.7	11.6	38.3	65.4
Total: Percentage		100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	865		291	315	259	251	386	228

* Running water, bathroom, telephone, mechanical refrigerator, six or more rooms in the house.

† Vacuum cleaner, power washing machine, gas or electricity available as cooking fuel, electric mixer, entertains social groups in the home, pressure canner, and operates farm of 160 acres or larger, in addition to the indicators listed in the previous footnote.

fication was exactly the same as when it had been grouped by the unweighted method.

A second method of weighting the indicators was tried. Each family possessing a selected indicator was given credit for an amount equal to 100 minus the percentage of families in the sample who possessed the indicator. Families with credits of 62 or less were considered as the low group, and those with credits of 73 to 147 and from 172 to 254 were classified as of the middle and the high groups, respectively. By this method, the classification of all except 10 of the 865 families was the same as when classification had been made by the unweighted system.

From the foregoing findings it was concluded tentatively that the differences in classifications of families by the weighted and the unweighted methods did not justify the trouble of weighting. For the remainder of this study classifications by economic indicators were made only in terms of the number of selected items possessed by the families.

Next, the families were cross-classified by income and by the 5 and the 12 unweighted indicators, respectively (table 1). Only about one-half of the families were classified identically as "low," "middle," and "high" by income and by either the 5 or the 12 indicators. This is not surprising since incomes do fluctuate from year to year, since the income reported by some of the respondents may have been inaccurate, and since the having of material possessions is not always closely associated with income class.

Characteristics of Farm Families Differing in Economic Status

In table 2 some answers are given to the question concerning differences in the characteristics of farm families and of their dwellings and selected possessions when the families are grouped by income and by the 12 economic indicators. By both methods of classification the percentages for all of the 13 characteristics studied were higher in the middle than in the low groups and also higher in the high than in the middle groups. Thus, it seems that classification of farm families by economic indicators, unweighted, would be an appropriate method for distinguishing families of middle economic status from those of extremely low or high economic rank. This method might also be used for grouping farm families in order to contrast and compare selected aspects of family behavior at the high and the low economic levels.

A Proposed Method

The present study proposes a method of classifying farm families in broad economic groups which may prove to be a useful alternative to classifying them by estimated income or by statistically determined economic scales. If tried out

TABLE 2

Characteristics and properties of families classified in three economic groups by estimated income and by twelve selected indicators

CHARACTERISTICS AND PROPERTIES	FAMILIES CLASSIFIED BY ESTIMATED INCOME AND SELECTED INDICATORS							
	Estimated Income				Twelve Selected Indicators*			
	Under $1500	$1500 to $2,999	$3,000 and over	Chi-square values	Low (0 to 3)	Middle (4 to 7)	High (8 to 12)	Chi-square values
	per cent	*per cent*	*per cent*		*per cent*	*per cent*	*per cent*	
Characteristics:								
Operated farms of 160 acres or larger	26.4	46.0	59.2	62.3	26.3	50.3	57.9	40.6
High school completed by:								
Homemaker	20.0	32.5	38.3	22.9	17.5	30.3	47.4	43.1
Head	16.8	23.9	30.7	10.8	16.3	22.3	36.8	24.0
Entertained social groups in the home	19.6	30.1	42.3	34.5	6.8	31.3	59.6	154.0
Dwellings had:								
Running water	19.2	32.2	54.6	80.5	3.6	28.8	87.3	744.0
Bathroom(s)	12.0	22.1	43.3	47.2	0.4	15.5	76.4	385.0
Six or more rooms	44.4	65.4	77.0	41.9	30.7	70.0	89.5	131.3
Possessions included:								
Vacuum cleaner	18.4	30.8	55.2	88.0	4.8	29.0	83.7	465.2
Mechanical refrigeration	36.8	50.2	73.6	59.4	12.4	57.8	97.8	352.1
Telephone	41.2	64.0	78.8	85.5	21.1	72.8	92.5	288.2
Gas or electricity as cooking fuel	27.6	42.6	64.1	41.3	11.2	46.6	84.6	257.6
Power washer	68.0	90.7	94.5	47.3	55.8	96.6	99.5	233.7
Electric mixer	8.0	10.7	23.6	33.6	—	7.5	43.4	168.5
Pressure canner	30.0	33.9	44.8	15.1	13.1	41.2	55.7	87.7

* Of the 865 families, 251 (29.0 per cent) were in the low group; 386 families (44.6 per cent) were in the middle group; and 228 families (26.4 per cent) were in the high group.

by several investigators, some of its values and limitations could be determined.

This method involves obtaining information from the families about hypothesized indicators of economic status which (1) probably have special significance in relation to the data to be analyzed in the investigation, (2) can be adapted to the time and place at which the study is being conducted, (3) can be identified and reported easily, accurately, and willingly by the family member being interviewed, and (4) can be interpreted meaningfully in reports of the study.

By such a method the investigator would include in the questionnaire questions for obtaining data about those characteristics which are assumed to be indicative of family economic status among the population under study. After the frequency of possession of each of the indicators had been determined by tabulation, those indicators which were too common or uncommon to be discriminatory could be disregarded.

Next, the families could be sorted into a small number of groups, the number depending upon the size of the sample and the detail of interpretation desired. Often, three groups will be sufficient. Sorting could be done in terms of the number of indicators possessed by each family. The number of indicators to be included in the "low," "middle," and "high" classifications could be determined by trying several groupings and choosing that one which yields the most equitable distribution of cases.

By crediting families according to the number of selected indicators each possessed, regardless of kind, quality, or quantity, no family will be penalized for possessing a given indicator instead of another. There would be no weighting of the indicators, a practice which may involve complicated calculations and may penalize or credit some families inappropriately. Indicators could be chosen in light of the nature of the study and of the characteristics of the population being studied.

Such a method would not pretend to be a scale. It would be an *indicant or an approximation* rather than a *measure* of economic status. But, for some studies of family behavior, it might be a more meaningful and realistic means of grouping farm families by economic criteria than are income estimates or statistically determined scales.

Program Outline for 1953 Annual Meeting of AHEA

Kansas City, Missouri

Theme: *YOU Are the Key to Better Relations*

Tuesday June 23	10:00 a.m.	General opening session: *YOU Are the Key to Better Personal Relations*
	2:00 p.m.	Discussion groups
	9:00 a.m.	Exhibits will remain open until 8:00 p.m. Tuesday
	8:00 p.m.	Missouri Night
Wednesday June 24	8:30 a.m.	Eye opener: *TV News in Foods*
	9:30 a.m.	General session: *YOU Are the Key to Better Public Relations*
	1:30 p.m.	Department meetings
	8:30 p.m.	Research meetings: *Interpreting Current Home Economics Research*
Thursday June 25	8:30 a.m.	Eye opener: *Today's House and the Things in It*
	9:30 a.m.	Division meetings
	2:30 p.m.	AHEA business and council meeting
	7:00 p.m.	Banquet: *In the Heart of America*
Friday June 26	8:30 a.m.	Eye opener: *Clothing and Style*
	9:30 a.m.	General session: *YOU Are the Key to Better Relations in the Greater Community*
	1:00 p.m.	Consumer Interests Meeting: *Symposium on Rayon and Acetate Standards*
	3:15 p.m.	AHEA council meeting

Home builders, architects, and householders find immediately applicable and practical help in the data from space studies on cleaning equipment. Homemakers can readily use the findings as a pattern for rearrangement of cleaning equipment for more efficient working procedures. Manufacturers of prefabricated closets can be guided by the data of this study on sizes and arrangements of closets for cleaning equipment and supplies.

The Storage of Cleaning Equipment

Helen C. Potter[1]

Dr. Potter is an associate specialist in housing research at the University of California at Davis.

FAR too often brooms and mops give our homes a look of disorder by peeking out from behind a door. They also cause accidents by falling across traffic lanes. The importance of adequate storage of cleaning equipment has been emphasized by the Committee on the Hygiene of Housing of the American Public Health Association. This committee recognizes that adequate storage of cleaning equipment can contribute to health by "reducing home accidents, insuring smooth operation of the household and . . . maintaining an orderly and attractive background" *(1)*. It lists closet space for cleaning equipment as one of the principal unfulfilled requirements in housing today.

Surveys show what little provision is made for cleaning equipment in present housing. More than one-third of farm homes in the Western Region have no closet of any kind, or only one. In over three-fifths of these homes there is no closet devoted to the storage of non-clothing items *(2)*. There are no closets in 38 per cent of the farm homes in the South, and 78 per cent of the houses have no closets for non-clothing items *(3)*. Nearly 17 per cent of the farm homes in the Northeast Region have no closets *(4)*. In the North Central Region 65 per cent of the farm homes have fewer closets than bedrooms and no closets for non-clothing items *(5)*.

Even where there are closets for non-clothing items, these may be filled with shelves or lack the height needed for the storage of long-handled equipment. Pantries, found in 21 per cent of the farm homes in the Western Region (36 per cent of those in the South and 46 per cent of those in the Northeast) *(6)*, may serve as a storage space for cleaning equipment. However, such a use is undesirable, as the dust adhering to the equipment may fall on dishes or contaminate food.

Inventories of cleaning equipment possessed by farm families emphasize the magnitude of the storage problem. Most farm families need storage space to keep at least one broom, a wet mop, a dry mop, a mop pail, and a vacuum cleaner. Additional storage space is required for an assortment of brushes, sponges, dust cloths, and cleaning supplies.

The problem. Adequate storage of cleaning equipment is so important to good home management that it seemed advisable to conduct research which would contribute to the improvement of house plans in this regard. The problem was defined and broken into its component parts:

1. A determination of inventories of cleaning equipment commonly possessed by farm homemakers
2. A determination of specifications for closets by testing sizes and types of closets and arrangements of cleaning equipment by time and motion study
3. An examination of the prefabricated closets offered on the market
4. A study of locations for closets to store cleaning equipment and supplies

Inventories of cleaning equipment. The basic data on inventories was obtained from the Survey of Farm Housing in the Western Region. This information was supplemented by a special survey

[1] This study was begun by Jean Warren, with the help of Marilyn McKay Moore. It was completed by Helen Potter, with the help of Dorothy Davis.

of the frequency of use of cleaning equipment by California rural homemakers *(7)*. The supplementary survey was considered necessary to ascertain which inventories should be included in planning active storage. For example 22 per cent of the brooms being stored are worn-out and superfluous *(8)*.

Certain common patterns emerge from both of these studies. A majority of farm families have at least three long-handled pieces of cleaning equipment plus a vacuum cleaner. Families without vacuum cleaners generally have less long-handled equipment than have those with vacuum cleaners. Three or fewer pieces of long-handled equipment were found in half of the homes with no vacuum cleaner and in only one-third of the homes with vacuum cleaners.

Investigations to determine typical inventories of cleaning supplies indicated that shelves having a total length from 30 to 40 inches, a depth from 5 to 7 inches, and a height from 5 to 12 inches were adequate. The maximum dimensions provided storage for upholstery cleaner, window cleaner, abrasives, furniture polish, wax, ammonia, bleach, soap, water softener, moth expellant, deodorizer, insect spray, and a scrubbing brush. (The shelves holding cleaning supplies often contain reserves of soap, paper towels, and toilet tissue. The amount of space needed for these depends upon the purchasing habits of the family.) Since soap, bleach, and water softener are always used in combination with water, they may be omitted from the closet and kept only at the source of the water. As the smaller, less economical sizes are frequently purchased, not through preference, but because there is insufficient space for the larger ones, allowances in shelf space were made for the most economical size.

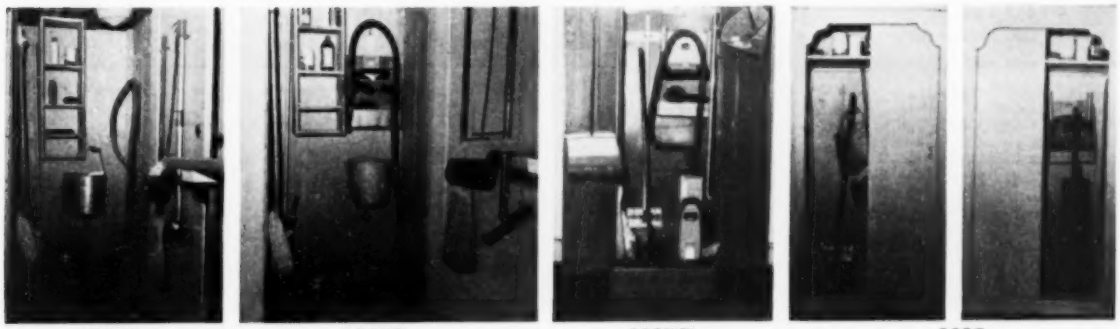
Little consideration was given to non-cleaning items which are often stored with cleaning equipment. Ironing boards, table leaves, and step stools (included in many of the closets previously designed for the storage of cleaning equipment) were used in only a few of the storage groupings. Their inclusion was inconsistent with two basic principles of good storage: first, that items should be stored nearest their first use, and second, that only equipment needed for one job should be stored together. Moreover, the problem of storing cleaning equipment is more universal than the problem of storing table leaves, step stools, or ironing boards. However, some consideration was given to these items, as planned storage is often a compromise between good home management and money and space.

Sizes of cleaning equipment. The range in size and shape of equipment must also be considered. Information was obtained from a study of the current market, supplemented by dimensions of older styles of equipment obtained through home visits. The findings, given in table 1, formed the basis for selecting representative items for test purposes. The equipment used in determining space requirements is starred in table 1.

Frequency of use of equipment. The dimensions of closets for cleaning equipment depend not only on the type of equipment but also on the way in which it is arranged. While the average inventories of equipment can be stored in a comparatively small space, storage is unsatisfactory unless the equipment can be removed easily. Frequency of use is a guide to arrangement, and questionnaires distributed with the co-operation of home advisers made this information available *(7)*.

Closet 60R
16 x 41 inches

Storage facilities used for tests. The first studies to determine dimensions of closets for storing cleaning equipment made use of an adjustable closet so constructed that both depth and width could be varied. The back wall of the closet was formed by two panels of ½-inch ply-



100R *16 x 35½ inches* | **102R** *16 x 35½ inches* | **111DD** *19 x 24 inches* | **123S** *20 x 35½ inches*

Some of the closet types and arrangements which were tested

wood, 24 inches wide and 72 inches high. These panels were moved on a track to vary the width from 24 inches to 48 inches. The side walls were ¼-inch plywood, 12 inches deep and 72 inches high. The depth was increased from 12 inches to 24 inches by attaching 4-inch boards to the front of the closet by means of wooden cleats. The closet floor was one inch high and could be increased from a depth of 12 inches to 24 inches.

TABLE 1

Sizes of cleaning equipment commonly found in the market

EQUIPMENT	WIDTH	DEPTH	HEIGHT	EQUIPMENT	WIDTH	DEPTH	HEIGHT
	inches	*inches*	*inches*		*inches*	*inches*	*inches*
Broom	7	¾	51	Dust pan	10	8	3*
	8	2	52		10	10	34
	10	2	54*		10½	8½	2
	10½	2½	54		10¾	10½	28½*
	10½	2½	55		11	12½	33
	10½	2½	56		11¾	7	2
	11	2½	56		12	8	2
	12	2	54		12	12	2½
	12	2	60				
	14	2	52				
				Floor	8	2½	51½
Sponge mop	9	2½	50½*	brush	10½	2	54½
				Mop	10½†		10
Wet mop	4†	4	50	pail	12¼†		10½*
(string)	6	1	50½		13½†		10
	6	2	60		14†		10½
	7	2	60		12	11½	10*
	7	7	48				
	9	2½	57	Upright	12½	14	46½
	9	9	51½*	vacuum	13	17	67
					13½	15	46
Tank	8†		23*		14	8	47½
vacuum	8½†		25½		14	13	48*
(1)‡	10†		13½				
	9½	6½	22	Carpet	14½	10	50
	10	10	24	sweeper	13½	10½	52*
	8	7	32		13¼	10	52
	11	7½	25		14½	10½	54
(2)§	12†		13½		15	10½	52
(2)§	12¼†		13		15⅝	10⅛	52

* Equipment used in determining specifications for closets for cleaning equipment.

† Diameter. ‡ In cart. § Canister type.

Either a left- or right-hand classroom door 42 inches in width served as the door for the closet (see photographs of closets 60R, 100R, and 102R). The closet was equipped with a removable four-shelf unit with over-all dimensions 36 inches high, 11½ inches wide, and 7¼ inches deep. This unit could be placed in various positions along the back or side walls (closet 60R, 100R). Ample variation in size to test different arrangements and combinations of cleaning equipment was provided by this type of closet. Its principal limitation was its door. A single door 42 inches wide presents major problems with regard to space and construction. It utilizes considerably more space than the actual storage space provided. It must be strongly built and carefully hung or it will sag. These disadvantages of the single door made it advisable to test closets with double doors and sliding doors.[2] Closets purchased in the market and not made to order furnished this testing equipment. The closets selected from the market included a wooden, sliding-door closet, 36½ inches wide, 23 inches deep, and 72 inches high (inside measurements 35½ inches wide, 20 inches deep, and 69 inches high (see photograph, closet 123S), and a lightweight metal closet 24½ inches wide, 20 inches deep, and 63 inches high (with inside measurements of 24 inches, 19 inches, and 60 inches). One of these, closet 111DD, is shown in the photograph above.

Baskets made of hardware cloth mesh were used in some arrangements for storing dustcloths and other small or light items. Three shapes were available, a triangular basket 15 inches by 6 inches which was designed to fit into the corner of the closet with the walls of the closet forming two sides of the basket, a rectangular basket 10 inches

[2] Plans have been made for some future tests using double-hinged and multifold doors.

TABLE 2

Equipment used in test closets

CLOSET NUMBER*	VACUUM† CLEANER	CARPET SWEEPER	BROOMS	DUST MOPS	HANGING SHELVES	BRUSH	VACUUM ATTACHMENTS	CLEANING BASKETS			WALL BRUSH	MOP AND PAIL	
								Round	Triangular	Rectangular		String	Sponge
10L	U	X	2	1		X	X	X	X			X	
10R	U	X	2	1		X	X	X	X			X	
11L	U	X	2	1		X	X	X	X			X	
11R	U	X	2	1		X	X	X	X			X	
20	U	X	1	1		X				X		X	
21L	U		1	1		X	X	X	X			X	
21R	U		1	1		X	X	X	X			X	
22L	U		1	1		X	X	X	X			X	
22R	U		1	1		X	X	X	X			X	
23L	U		1	1		X	X	X	X			X	
23R	U		1	1		X	X	X	X			X	
24L	U		1	1		X	X	X	X			X	
24R	U		1	1		X	X	X	X			X	
25L	U		1	1		X	X	X	X			X	
25R	U		1	1		X	X	X	X			X	
26L	U		1	1	X	X	X	X	X			X	
26R	U		1	1	X	X	X	X	X			X	
27L	U		1	1	X	X	X	X	X			X	
27R	U		1	1	X	X	X	X	X			X	
30L	U		2	2	X	X	X	X	X		X	X	
30R	U		2	2	X	X	X	X	X		X	X	
40L			1	1	X	X		X	X			X	
40R			1	1	X	X		X	X			X	
50L			2	1	X	X			X			X	
50R			2	1	X	X			X			X	
60L	U	X	2	2	X	X	X	X	X		X	X	
60R	U	X	2	2	X	X	X	X	X		X	X	
61L	U	X	2	2	X	X	X	X	X		X	X	
61R	U	X	2	2	X	X	X	X	X		X	X	
70L	U	X	1	1	X	X	X	X	X			X	
70R	U	X	1	1	X	X	X	X	X			X	
80R	U		1	1	X	X	X	X	X			X	
81R	T		1	1	X	X	X	X	X			X	
82R	T		1	1	X	X	X	X	X			X	
90			1	1		X						X‡	
91			1	1		X						X‡	
92			1	1		X				X		X	
93L			1	1		X				X		X	
93R			1	1		X				X		X	
100R	C	X	1	1	X		X						X
101R	U	X	1	1	X		X						X
102R	T	X	1	1	X		X						X
103R	T	X	1	1			X						X
104R	U	X	1	1			X						X
110DD	U	X	1	1			X	X		X			X‡
111DD	T	X	1	1			X	X					X‡
112DD	C		1	1			X		X				X
120S	T	X	1	1			X						X
121S	T	X	1	1			X						X
122S	C	X	1	1			X						X
123S	U	X	1	1			X						
150R§	U		1	1			X					X	
151R‖	U		1	1			X					X	
152R¶	U		1	1			X					X	

* L—left-hand door; R—right-hand door; S—sliding door; DD—double door.
† U—upright; T—tank; C—canister.
‡ No provision for pail.
§ Included table leaves.
‖ Included table leaves and step stool.
¶ Included table leaves, step stool, and ironing board.

by 15 inches, and a circular basket 21 inches in diameter.

Tests. Fifty-four different sizes, shapes, and arrangements of closets were studied. The inventories included in each of the closets are shown in table 2. Some closets had only brooms and mops. Some had brooms, mops, and an upright vacuum cleaner. Others had brooms, mops, an upright cleaner, and a carpet sweeper. Still others had a broom, mop, long-handled dustpan, mop pail, carpet sweeper, and upright vacuum cleaner. This same combination of equipment was varied by the use of different types of tank cleaners. It was also varied by a short-handled dustpan, a less efficient but more commonly owned piece of equipment than the long-handled dustpan. Two closets contained

table leaves, an ironing board, and a step stool. Door caddies for the storage of cleaning equipment were also tried.

Time and motion study methods were used in testing the convenience of different arrangements of equipment in closets of different dimensions. Some tests were made on the removal and replacement of all equipment from the closets. These tests quickly eliminated arrangements where one piece of equipment interfered with the removal of another. However, the time consumed in these tests, the opportunity for variables to persist in such a long process, and the difficulty of standardizing the process made it inadvisable to test the efficiency of different arrangements in this way. The removal and replacement of the broom and dustpan provided a shorter process and furnished valuable information on the arrangement of this equipment. However, it was not suitable for testing comparative arrangements, as many changes in arrangement could be made without affecting the ease with which the broom and dustpan could be removed. The vacuum cleaner was then selected to test the efficiency of various arrangements as it seemed to reflect these changes best. The test was improved by combining one piece of long-handled equipment with the vacuum cleaner. The dry mop was selected because it is frequently used with the vacuum cleaner when the floor-brush attachment is not employed and requires no additional equipment. The broom would require a dustpan and the wet mop a pail. If three pieces of equipment had to be removed, the advantages of a short process would be partly lost.

The processes for removing a vacuum cleaner and dry mop were charted and standardized. In the process charts for all tank cleaners, in addition to the processes given for the upright cleaner, there were processes for removing a unit composed of two extension rods and a floor brush from a holder on the closet door or closet wall, attaching these to the tank hose, and removing and replacing them after use. Other variations in the processes used were necessitated by differences in types of door. Each process was repeated three times to constitute a single test. Two operators tested each arrangement. Three to five tests by each operator were sufficient except where the standard deviation exceeded plus or minus 5 (*9*).

Findings. The tests demonstrated that the arrangement and design of closet 60R enabled the operator to remove and replace the test equipment in the shortest time. This closet, shown in the photograph, is 41 inches wide, 16 inches deep, and 72 inches high. A broom, short-handled brush, and dry mop hang on the door with the broom next to the knob of the door. Vacuum cleaner attachments are on the left wall. A circular and a triangular hardware cloth basket hang high in the angle formed by the back and left walls. A vacuum cleaner stands at the left side of the closet with the bag toward the door. A storage-shelf unit hangs in the center of the back wall with the wall brush in a clamp on the left side of the unit and the wet mop in a clamp on the right side above the pail. A second broom hangs on the right side of the back wall, and the carpet sweeper is on the right with bristles flat on the floor. The height is necessitated by the four-shelf unit.

There was a marked increase in the time consumed by the process when the dry mop was stored on a wall of the closet and not on the door. The process time was less when the upright vacuum was stored with bag toward the door than when it was turned with the front or side of the cleaner toward the door. Hose and vacuum cleaner attachments were removed with greater ease when stored on the wall at the side of the upright cleaner than when stored behind the cleaner. The process took less time when the vacuum cleaner was near the door knob than when it was near the door hinges. The process was considerably lengthened when the upright vacuum cleaner was replaced by a tank type, as the latter cannot be removed from the closet and made ready for use unless attachments are connected. The process time was especially high when the handle of one piece of equipment was behind that of another. The process time was less with the mop or broom stored head down than head up. A clamp holder eliminated the wear which would take place if the head rested on the floor. The process time was increased by excessive closet depth. It was decreased by a door opening which gave full view of all the equipment.

These tests brought out the importance of certain design features. If a closet door opens to expose the entire width of the closet, a width of 28 inches and a depth of 16 inches are adequate for convenient storage of one broom, a long-handled dustpan, an upright vacuum cleaner, vacuum cleaner attachments, a wet mop, mop pail, dry mop, short-handled brush, and a circular and a triangular mesh basket, if broom and dry mop or dry mop and dustpan are hung on the door. When a canister vacuum cleaner is used the closet must be 35 inches wide by 16 inches deep or 32 inches wide by 20 inches deep. With the deeper dimensions the hose connection is at the front; it is at the

side when the closet is shallower and wider. The deeper closet is somewhat more convenient for the canister cleaner than is the shallower one. These closets have room for the tier of shelves if it is hung 13 inches from the right side and 8 inches from the left. The case of attachments and a quarter of the pail are directly under the shelf unit. Where an upright vacuum cleaner is used with the shelf unit the dimensions must be at least 33 inches wide and 16 inches deep. The wet mop should be attached to the left side of the shelf unit and the broom and dry mop stored on the door.

If a tank cleaner can be stored on end, a closet 24 inches wide and 16 inches deep is sufficient for the above equipment. The tank cleaner which cannot be stored on end and must lie in a horizontal position requires that a closet 16 inches deep be at least 28 inches wide. Eight additional inches of width are needed if a carpet sweeper is added and stored flat on the floor,[3] with the side of the sweeper parallel to the front of the closet. A closet 24 inches wide and 12 inches deep is adequate for a broom, wet mop, mop pail, dry mop, short-handled brush, and two mesh baskets. A closet 48 inches wide by 21 inches deep is needed if three table leaves, a step stool, pail, upright vacuum cleaner, vacuum cleaner attachments, and wet mop are stored in the closet with broom, mop, and dustpan on the door. If an ironing board were stored beside the table boards, the width of the closet would have to be increased to 55 inches. No closet devoted solely to the storage of household cleaning equipment needs to be more than 41 inches wide and 16 to 20 inches deep. Where the same number of square feet is achieved through greater depth, the closet is less convenient.

The tests made it evident that cleaning supplies can be more easily removed and replaced if they are stored on a tier of adjustable shallow shelves than on a shelf extending across the top of the closet. Space was saved by locating the tier of shelves in the least accessible part of the closet against the middle of the back wall (see photograph). The sides of the unit provide wall space on which equipment can be hung conveniently. This type of shelf unit is practical only if the closet is at least 33 inches wide. When used in a smaller closet, the shelves are in the way and frustrate the operator, thus prolonging the process time. In the small closet the high shelf, which does not interfere with the removal of the equipment, is more satisfactory. It has the added advantage of keeping poisonous cleaning supplies out of the reach of small children.

Small wire mesh baskets were found to be advantageous in many arrangements. These can be attached to any part of the closet walls or doors where there is a vacant space. They are a convenient and economical method of adding to the storage space for small and lightweight supplies.

An attempt was made to store the broom, dry mop, wet mop, and mop pail on the closet door, with the pail in a bracket attached to the door.

[3] Although the carpet sweeper is subject to slightly less wear and consumes less storage when the bristles are not resting on the floor, the sweeper can be removed from the closet and replaced again with considerably greater ease if the bristles rest flat on the floor of the closet.

TABLE 3

The efficiency of various types of closets for the storage of cleaning equipment as revealed by time studies on the removal of cleaning equipment

TYPES OF EQUIPMENT REMOVED	TIME TAKEN TO REMOVE EQUIPMENT FROM VARIOUS TYPES OF CLOSETS						INDEX OF TIME TAKEN TO REMOVE EQUIPMENT FROM VARIOUS TYPES OF CLOSETS		
	Custom-Built 1-Door (Wooden)		Two-Slide Door (Wooden)		Two-Pull Door (Metal)		Custom-Built 1-Door (Custom-built 1-door closet = 100)	Two-Slide Door	Two-Pull Door
	minutes	*seconds*	*minutes*	*seconds*	*minutes*	*seconds*			
Upright vacuum cleaner and dry mop	1	38.5	1	40.7	1	55.4	100	102.2	117.2
Tank vacuum cleaner (brand A) and dry mop	2	55.8	3	4.8	3	4.9	100	105.1	105.2
Tank vacuum cleaner (brand B) and dry mop	2	52.1	3	26.2	Too large for this closet		100	119.8	Equipment too large for closet
Canister vacuum cleaner and dry mop	2	38.1	2	59.2	3	18	100	113.3	125.2
Broom and dustpan	1	7.4		46.4	1	14.3	100	68.8	110.2
All equipment*	4	45.1	4	11.5	5	47.2	100	88.2	121.8

* Includes broom, long-handled dustpan, dry mop, dust cloth, upright vacuum cleaner, vacuum cleaner attachments, sponge mop, mop pail, and carpet sweeper.

The door was inadequate for storing the mop pail, but the other three items were stored there satisfactorily.

The single-door wooden closet was compared with a sliding-door wooden closet and a two-door metal closet. Tests on the sliding-door closet revealed both advantages and disadvantages to this design. The process time was increased by the elimination of door storage and decreased by the shorter time consumed in closing the doors. The net result was that the process time was longer in some cases and shorter in others than the process time for the one-door closet (table 3). The sliding-door closet can be left open while cleaning equipment is in use, as the open door does not protrude. The closet takes less room, as the space required for the door swing is eliminated. It looks neat and is suitable for any part of the house. It is available as a ready-made unit and has the price advantage of mass production. One of its disadvantages lies in the fact that only half of the closet front can be opened at once. This results in less effective use of the central portion of the closet and a small opening which makes the worker feel cramped. Furthermore, where tracks for the slide are placed on the floor as well as the ceiling, equipment must be lifted over these tracks and cannot be slid out of the closet.

The process time for the small, two-door closet was consistently higher than for the other two closets. This was partly due to its small dimensions and partly to the need for closing two doors instead of one. Time saving from storage on the closet doors was less, as only small equipment could be placed on such narrow doors. When this equipment was not attached firmly, it caused an increase in the process time by swinging and interfering with the closing of the doors. Other disadvantages were the difficulty of installing broom holders and other types of fittings and the tendency of the doors to sag and walls to bulge. The closet had to be fitted with a wooden molding to make hooks and holders adjustable. Only an expensive heavy-weight metal or double wall construction could eliminate the sagging and bulging. The principal advantages of the metal closet were the little space used by the open doors, the wide opening, the low price due to its size and quality, its light weight, its portability, its non-inflammability, and the small amount of floor space it consumed.

Two specifications for closets were found to be especially important: those for ventilation and those for the height of the closet floor. A floor which is flush with the floors of the house greatly facilitates the removal of vacuum cleaners. However, the door will not slide or swing freely unless it is slightly raised. A closet floor or door sill one inch above the regular floor will interfere little with the removal of equipment while keeping out the dust and allowing the door to move freely.

Ready-made closets. The market was explored to determine the availability of prefabricated units for the storage of cleaning equipment. It was found that most of the units sold for this purpose are too small for the efficient storage of the cleaning equipment possessed by the average family (table 4). Many of the units appear to be designed to fit into a given space rather than to fit the equipment to be stored. They are generally too narrow, too deep, or too short, or have two compartments one above the other, which are both too short. The closets offered on the market as "wardrobes," when slightly modified by taking out a shoe rack or moving a shelf, provide better storage for cleaning equipment than the so-called "broom" closets. Both of the ready-made units upon which extensive tests were made are offered on the market as wardrobes. Wardrobes are often less expensive than the units sold as "broom" closets.

Location of closet. Duplicate cleaning equipment and dual storage may be desirable, but the lack of any closets for cleaning equipment in most homes today makes it wishful thinking to plan for multiple storage. One guide for locating a closet for cleaning equipment and supplies is to place it

TABLE 4

Prefabricated units for the storage of cleaning equipment

MANUFACTURER	DIMENSIONS OF CLOSET	MATERIAL USED
	inches	
A	18 wide, 22 deep, 86 high	Pine
	20 wide, 14 deep, 86 high	
	24 wide, 22 deep, 86 high	
B	18 wide, 12 deep, 66 high	Steel
	24 wide, 12 deep, 66 high	
C	36 wide, 24 deep, 91½ high	Plywood
	24 wide, 24 deep, 91½ high	birch
D	48 wide, 19½ deep, 72 high	Plywood
	36 wide, 18 deep, 78 high	
E	36 wide, 24 deep, 78 high	Steel
	24 wide, 18 deep, 78 high	Steel
	24 wide, 24 deep, 78 high	Steel
F	24 wide, 20 deep, 66 high	Steel
	35½ wide, 20 deep, 72 high	Pine
G	24 wide, 24½ deep, 84 high	Aluminum
H	21 wide, 13 deep, 84 high	Steel—one door above the other
I	20¾ wide, 4 deep, 68 high	Steel—fits on door
J	24 wide, 20 deep, 66 high	Steel
	18 wide, 23 deep, 76 high	Plywood
K	23 wide, 20 deep, 60 high	Steel
	24 wide, 20 deep, 63 high	

near the area which has the most traffic and needs cleaning most frequently. In many farm homes this area can be identified with the kitchen. Where the kitchen is used largely by the homemaker alone, the area is likely to be the bathroom. In some homes a room where children play may be the area most served by cleaning equipment.

Cleaning routines may be another guide to the location of the closet. As storage of equipment should be nearest its first use, the closet should be located near the place where cleaning ordinarily begins. Available space must be the deciding factor, and houses should be so planned that this space is available in a convenient location such as a centrally-located hall.

Conclusions. To minimize the time it takes to remove and replace equipment from the closet, make the closet easy to keep clean, and provide good storage conditions, the following design features are desirable:

1. Door firm and sufficiently large to store on it a broom, dustpan, and dry mop (Equipment stored on closet door is most accessible.)
2. Opening as wide as closet (This brings all equipment into view.)
3. Doors not in the way when open (Sliding doors have this advantage but reduce the opening to one-half the width of the closet and allow no storage on doors. Multifold doors increase the opening but allow for no storage on door.)
4. Doors which open and close easily and quietly
5. Closet door and closet floor flush with the floor of the house to eliminate the need for lifting equipment off the floor when removing or replacing it
6. Only overhead tracks for sliding doors to eliminate need of lifting equipment over tracks
7. Adjustable broom holders for long-handled equipment (It takes less time to push a handle into a broom holder than hang it on a hook, and this eliminates need of fastening rings on equipment.)
8. Doors and walls of a material to which broom holders and hooks can be easily attached (Very hard wood or metal are undesirable from this standpoint.)
9. Dimensions that allow for a clearance of from one to two inches between pieces of equipment and two inches above and below equipment which hangs on walls (Clearance depends upon size and weight of equipment; smaller and lighter equipment requires less clearance.)
10. A closet depth not exceeding 20 inches to prevent excessive reaches and the need for storing equipment in two rows on the floor
11. A tier of shelves in the center back instead of a high shelf at the top of the closet for the storage of cleaning supplies and small equipment (This makes supplies more accessible, and the sides of the unit provide highly accessible wall space for hanging equipment.)
12. Good ventilation
13. Firm and durable walls which will not sag or bulge (Closets of fiberwood are not satisfactory in this regard.)
14. Rounded corners and smooth and washable finishes on wall and floor to reduce labor in cleaning the closet
15. A ceiling furred down to the top of the closet to keep dust from collecting on top of it.

The findings on storage requirements for cleaning equipment do not lend themselves to a single set of specifications. Neither the location nor the dimensions for the closet should be arbitrarily selected. Ideally, the closet should be designed to meet the functional requirements of each family. However, the research findings presented here may serve as a guide to planning and help to prevent mistakes. They may help the builder of tract houses to use those specifications most likely to meet the needs of the unknown buyer. They may contribute to raising the standards of living through better home management.

References

1. American Public Health Association, Committee on the Hygiene of Housing. *Planning the Home for Occupancy*. Chicago: Public Administration Service, 1950, pp. 17-18.
2. Woolrich, A., Beveridge, E., and Wilson, M. Housing Needs of Western Farm Families. Western Coop. Ser. Research Rept. No. 1, 1952, Table IV, p. 16.
3. Farm Housing in the South. Southern Region Pub. 14, 1951, pp. 13-14.
4. Beyer, G. *H. Farm Housing in the Northeast*, Ithaca: Cornell University Press, 1949, p. 36.
5. Farm Family Housing Needs and Preferences in the North Central Region. Iowa State College, Agricultural Expt. Sta. Research Bull. 378, Feb. 1951, p. 8.
6. Woolrich, *A., et al., op. cit.*, p. 16.
   Farm Housing in the South, *op. cit.*, p. 14.
   Beyer, *G. H., op. cit.*, p. 34.
   (No data for North Central Region)
7. Potter, H. Frequency of use of cleaning equipment. *J. Home Econ.* **44** (1952), pp. 786-789.
8. The Kenyon Research Company, A Study of The Consumer Broom Market, Tables 15 and 34 (Unpublished report, 1950).
9. Mundel, M. E. *Motion and Time Study*. New York: Prentice-Hall, 1951, p. 295.

COLLEGE CLUBS

MRS. CAROL BEST, *EDITOR*

Home Economics Students at Science Conference

Susan Manley

Home economics papers were second highest in number in any one field presented at the 17th annual Connecticut Valley Student Science Conference last spring at Mount Holyoke College. Susan Manley, 1951-52 president of her home economics club at Connecticut College, writes about these papers, including two which she helped to prepare.

MANY different sciences were represented in the 70 papers read at the Connecticut Valley Student Science Conference last April. Thirteen of the papers dealt with student research in the field of home economics. Purpose of each year's Conference is to give students an opportunity to obtain insight into the interrelatedness of the different sciences as well as to increase their understanding of research techniques and skills. The meetings are always planned and conducted entirely by students and patterned after professional meetings where original research is reported.

I had a part in preparing the paper entitled "Comparison of the Nutritive Value and Cost of Multiple Vitamin Preparations and Foods in the Daily Diet of College Women." We made a chart comparing the vitamin content of 15 common multiple vitamin compounds showing the form, cost, and amount of each vitamin in a daily dosage. The vitamins studied were A, B_1, riboflavin, niacin, and C, since these are the ones most often found in multiple vitamin capsules. It was found possible to secure the recommended allowance of each of the vitamins in typical daily diets without supplementation with vitamin preparations. The comparative cost of vitamin preparations and a number of representative foods was shown on histograms; the results indicated that when considered as a sole source of the vitamin, the preparations tended to cost less than the foods containing them.

Basic Seven Food Groups

Another part of the study showed three skeleton diets using the basic seven food groups with the amount of each vitamin estimated in each of the foods included. When the daily intake for each vitamin in the skeleton diets was compared with the recommended daily allowances, it was found that in almost all cases requirements were met by the food without the supplementation of the multiple vitamin compounds. Even though the recommended dosages of the vitamin preparations were found to give sufficient vitamins to meet standard needs, it was concluded that the natural foods may be more satisfactory because they provide cellulose, minerals, and other nutrients as well.

Another study from Connecticut College in which I participated was "Contrasts in Preparation, Quality, and Price of Homemade and Commercial Mixes." We compared quality of gingerbread, corn meal muffins, and chocolate cake made with prepared mixes and quality of the same foods made in the traditional way.

Children Studied

A third paper presented by Connecticut College students was "Number of Experiences of Four-Year-Olds." This study was made on six children aged three years, two months to four years who came from middle- to upper-middle-class families. To quote from the experiment, "the purpose of this study was to determine the child's use of terms relating to opposites and comparisons, spacial relations, number experiences, and time sequences in uncontrolled and controlled situations." Records of the children's remarks during a one-month period were made by student teachers either while they worked with the children or as they observed from the sidelines. An individual record was made for each child which was not compared with other individual records but was compared with the child's own achievement and progress.

It cannot be concluded from this study that increasing age brings an increase in accuracy in

distinguishing size, using numbers, and having definite concepts of space, because the study was limited in sampling and in accuracy of control. However, it was observed that each child progressed at a different rate and that the older children used the terms related to the elements listed above more frequently than did the younger children. The students concluded that the child's environment may aid progress in his understanding and use of the terms.

Exhibits

Connecticut College students also set up two exhibits. One demonstrated the effect upon the stability of the product of different emulsifying agents used in making mayonnaise. The oil was colored with red dye in order that the results might be readily visible under a microscope. The stabilizing agents used in making the mayonnaise products were whole egg, egg white, egg yolk, cornstarch, and gelatin. The second exhibit compared eight commonly used kitchen utensils with reference to materials employed, quality, type of construction, and price.

Three papers were prepared by students from the University of Massachusetts. One was entitled "Functional Storage in the Kitchen." The student approached her problem by making a flow chart of the steps that her mother used in preparing an apple pie. After analyzing the chart, she rearranged the storage of utensils and supplies within her kitchen. There was a reduction of steps and of wasted motion when her mother prepared the apple pie in the rearranged kitchen. Another phase of this study involved remodeling sections of the kitchen to increase the ease of meal preparation and improve the storage facilities.

Another student from the University of Massachusetts presented a paper entitled "Tryptophan-Nicotinic Acid Relationship in Pregnant Rats." This represented research on nicotinic acid metabolism in rats during pregnancy. The study was undertaken to discover if the urinary excretion of the metabolites of this vitamin showed a much higher nicotinic acid utilization during pregnancy than during the nonpregnant state. A nicotinic-acid-free diet was fed to white rats and tryptophan, a precursor of nicotinic acid, was given to them as the known source of this vitamin. The level of the tryptophan intake was varied, and the effect of the amount of intake on the excretion of N^1-methylnicotinamide was studied. Samples of urine were collected at weekly intervals before, during, and after pregnancy. N^1-methylnicotinamide was determined by a fluorometric method. Further experiments are being conducted along this line at the University of Massachusetts. Conclusive results were not given in the paper.

One of the papers presented by students from the University of Connecticut was entitled "Alteration in College Girls' Clothing" and dealt with those alterations which are required most frequently on the outerwear of a college girl's wardrobe. This study included the kind of alterations college girls do themselves, the time involved, the cost of having various alterations done at stores or by local dressmakers, and the influence of needed alterations on desire to purchase a specific garment.

In another paper, coat preferences and purchasing habits of freshmen, sophomores, juniors, and seniors at the University of Connecticut were compared. The study also showed a comparison of the purchasing habits of students who were partly self-supporting and those who were entirely supported by their parents.

A third investigation presented by a student from the University of Connecticut was concerned with "The Deterioration of Ascorbic Acid in Tomato Juice." This was a study of the deterioration in the vitamin C content of commercially canned tomato juice when opened cans stood at room temperature for five days. This tomato juice was kept in dormitory rooms by students to use at late afternoon or evening snacks. (They did not have access to refrigerators.) The student reported that each serving from a 46-ounce can provided more vitamin C during a five-day period than each serving from a smaller and relatively more expensive can. The yield of juice per unit cost was also greater with the 46-ounce can.

First Conference in 1930

The Connecticut Valley Science Conference had its beginning in the year 1930 when students from Mount Holyoke College held a science meeting to which they invited students from several of the neighboring colleges. At the original meeting only students from Mount Holyoke College presented papers. The conference was considered a valuable experience that should be repeated. The following year students from Amherst College, Smith College, University of Massachusetts, Springfield College, Trinity College, Connecticut College, and Wesleyan University took part. Since 1941, American International College, Dartmouth College, Saint Joseph College, Teachers College of Connecticut, Williams College, and the University of Connecticut have joined the group.

Abstracts of Doctoral Theses Related to Home Economics, 1951-52

Following are abstracts of doctoral theses by home economists and by others in closely related fields presented during the academic year 1951-52. The selection of abstracts was made from the list of titles of 1951-52 theses in home economics and related fields as compiled by the Bureau of Human Nutrition and Home Economics and the Home Economics Education Branch of the U. S. Office of Education. The abstracts published here and the titles listed include those by home economists and a selection of those from related fields which are of particular interest to home economists. They represent research in various areas of home economics. With each abstract is the title of the thesis, the name of the author, and the name of the college or university that awarded the degree.

Education

An Analysis of the Responsibilities of the First-Year Homemaking Teacher with Implications for Teacher Education, MARGARET A. COLEMAN, *Teachers College, Columbia University.*

The purpose of the study was threefold: (1) to analyze the responsibilities of first-year homemaking teachers, (2) to discover the areas of their greatest strengths and weaknesses, and (3) to prepare recommendations for the improvement of teacher-education programs.

Throughout the study there was abundant evidence that the teachers assumed multiple curricular duties to the best of their ability and experience.

However, there was no evidence of the use of effective techniques for diagnosing human relations needs among their students. Many felt inadequately prepared to handle guidance responsibilities, and 52 per cent experienced perplexing conduct situations. One-third of the teachers felt inadequately prepared to advise their FHA chapters.

Needs were further indicated by the authoritarian philosophy which obviously governed their choice of educative experiences and evaluation techniques.

A random sample of 1,139 class periods was analyzed. This revealed that the teachers devoted 48 per cent of their class time to the skills and techniques of foods and clothing. The other 52 per cent was spread through eight remaining areas.

The implications drawn from the analysis of the responsibilities of the first-year homemaking teachers gave rise to six major recommendations. In addition, findings showed that when accepting the invitation to participate in this study, many of the teachers sought specific help. Therefore, the project concludes with specific suggestions incorporated in the form of a letter to the beginning homemaking teachers.

Elements That Seem to Contribute to Successful Adult Education Programs in Selected Public Schools of the State of New York, FANNIE M. DEGROAT, *Cornell University.*

The adult education programs of 17 school systems, large and small, for the year 1949-50 in various parts of the state were studied.

In the research three instruments were used: (1) A list of elements that seemed important in a successful program was appraised by 20 educators in order to obtain a criterion for the evaluation of the programs; (2) a questionnaire of 68 questions was used in personal interviews with administrators in the study of their adult education programs; and (3) a form was answered by 49 teachers who had been named as those whose classes were especially well received in the various communities.

An objective interpretation of the findings gives the following elements that enter into successful programs: participation of representative groups of citizens in the organization and development of the program; classes held in centers and at times convenient to adults; publicity to acquaint all community members with the offerings; teacher's knowledge of subject matter; employment of a democratic spirit in the classroom; and co-operation of school and community leaders in extending learnings.

Other factors that would seem to provide for improved programs but which were not generally employed were: surveys in communities that would help indicate the educational interests and needs of adult citizens; objective evaluation of the program; organized effort directed toward improving the quality of instruction; and utilization of the care of children for improved home and family life.

Adults in increasing numbers are desiring educational experiences. If the program in the public school is to meet their needs certain changes might well be effected to provide: preparation and employment of an adequate staff, suitable facilities, and increased learning opportunities.

The Preparation of Homemaking Teachers: Ten Years of Experience at the New York State College for Teachers at Buffalo, New York, MARGARET A. GRANT, *The University of Buffalo.*

The purpose of this investigation was to collect evidences of the effectiveness of the home economics cur-

riculum as indicated by the graduates of the College who were teaching and their administrators. Only those people who graduated in the ten-year period of 1939 to 1949 and who were teaching in New York State were asked to participate in this study.

One hundred twenty-two homemaking teachers and 113 of their administrators co-operated. These individuals represented 91 per cent of the graduates of that ten-year period who were still teaching and 91 per cent of their administrators. The schools represented were centralized, village, and city schools located in 33 of the 63 counties in New York State.

The questionnaire method of collecting data was used. The questionnaire sent to teachers was composed of eight parts, in some of which there were controlled responses while in other sections free responses were requested. The instrument sent to administrators had four parts, two of which were controlled responses and two of which were free responses.

The highest consensus of agreement in responses was found on items dealing with relationships. Administrators rated the teachers high in assuming responsibility in the school as a whole and in co-operation within the school. Many teachers said that they would like teaching better if they did not have to assume any responsibility for the school lunch. They also reported that their teaching was less effective than it should be because they had to devote so much time to the school lunch. Twenty per cent of the respondents listed school lunch as their most difficult problem since graduation.

A large number of the teachers said they did not have time for home visits although they also reported that their load and number of pupils were light enough to make it possible for them to do effective work. One of the three items related to student teaching which were reported as having realized little or no value was that of establishing relationships with the homes.

The greatest value realized in student teaching was in learning to work co-operatively with individuals and groups in planning learning experiences. Other items listed as of great value were conferences with the supervising teachers, establishing relationships within the school, and developing a philosophy of homemaking education.

Ninety seven per cent of the teachers reported feeling secure or very secure in teaching at the junior-senior high school level. Elementary and adult were the levels at which the respondents said that they felt insecure in their teaching.

College courses in education, foods, and clothing were reported as having been most valuable to the teachers in this study. Family life courses were reported as helpful to them personally, but the teachers said that they felt insecure in teaching the subject. One out of five teachers reported feeling insecure in teaching management. These teachers reported their greatest feeling of security in using discussion and laboratory techniques in teaching.

The greatest number of suggestions for improving the curriculum were for more elective courses in the field of specialization as well as general education. The administrators' suggestions were in accord with the latter. They appraised their teachers as "average" in knowledge of society and its problems and suggested this as an area in which the preparation of homemaking teachers might be improved.

This investigation brought to light many interesting facts concerning the curriculum. Some of the suggestions can readily be accomplished within the present framework without too much difficulty. However, some suggestions necessitate more time than is now allowed in a four-year preparation program. Therefore, including a fifth year in the pre-service program should have thorough consideration.

Home Economics in General Education in Institutions of Higher Learning: The Role of Home Economics in Education for Home and Family Living as a Part of the General Education of Students in Six Selected Land-Grant Colleges, FRANCES JENSEN, *Cornell University.*

This study was based on the hypotheses that (1) educational leaders are coming to consider education for home and family living a vital part of the general education of land-grant college students, (2) many educational leaders feel that home economics units have a definite responsibility for providing a part of the education for home and family living which should be available to land-grant college students, (3) home economics leaders in the land-grant colleges have made headway and are encouraging interdisciplinary co-operation in providing education for home and family living available to all students, and (4) students not registered in home economics units are insufficiently encouraged to enroll in courses dealing with education for home and family living.

Administrative, home economics, sociology, and educational leaders were interviewed at six large land-grant universities. It was hoped that a trend in attitudes and expectations for future developments might emerge from this material to clarify the role of home economics in home and family life education for college students.

The findings show what the educators interviewed said the home economics unit at their institution was then making available for all students as a contribution to general education. The data also describe what these educators would consider ideal contributions by home economics to general education. They point out the difficulties which home economics must face in attempting to reach these ideals and suggest possibilities whereby home economics may strive to approach these ideals in the future.

To date, preparation for home economics to contribute to general education on any large scale has been inadequate. Change in, or effective contribution to, home and family life education as a part of general education should be made first through the philosophy

and preparation of the personnel and second through the curriculum itself. Indications from the interview reports point to a considerable responsibility for leadership by home economists in establishing and maintaining any program of education for home and family living as a part of the general education of college students.

A Plan for Family Life Education at Hood College, MARY E. MATHER, *Teachers College, Columbia University.* [Miss Mather was the AHEA's Ellen H. Richards Fellow for 1946-47.]

Homemaking and parenthood are the most characteristic occupations of alumnae and represent the generally anticipated occupation of students as revealed in this study of family life education at Hood College. The report focuses on how a liberal arts college for women can develop a college-wide program in family life education co-ordinating the contributions of students, staff, alumnae, campus activities, and resources in the community.

Responses from student and alumnae questionnaires gave clues for program planning. Problems most frequently suggested by students—family relations, family economics, and child guidance—were rated high in importance for study by alumnae also. Young homemakers rated study of home management important and many students anticipated problems in this area. Courses in practically all departments of the college were listed as sources of help for family life.

Recommendations include the formation of a family life council of faculty, students, parents, and alumnae to plan for, co-ordinate, and evaluate a college-wide program of family life education. Family centered experiences in home economics, readily available to all students, are one part of the program. In addition, faculty would be encouraged to discover how graduates use learning from all major fields in their family living and to plan to extend such learnings. Advisers, recognizing students' family goals, can help them plan experiences to increase competencies for family living. Career conferences can contribute by showing how homemaking, parenthood, community service, and wage-earning dovetail in modern life. Student life in dormitories and activities in organizations provide experiences in human relations and give opportunity for development of insight and understanding of family problems. Individual homes in the community and agencies dealing with families serve as other resources for student learning about family situations. Alumnae conferences and articles in the Hood College *Alumnae Bulletin* represent some of the ways proposed for extending family life education to Hood College graduates.

Toward a Theory of Human Nature and Growth: A Basis for a Philosophy of Education for Lebanon, PERGROUHI H. NAJARIAN, *Cornell University.* [Miss Najarian held the AHEA's Omicron Nu international scholarship at Cornell University during the academic year 1951-52.]

This study has two parts. The first part presents some aspects of Arab civilization and relates them to educational efforts in Lebanon. It then presents John Dewey's philosophy of education as a source of help for meeting some of the problems of the country.

Interaction with the West has created two periods in Arab civilization. The first is marked by an impact of the Arabs on the West. The second is marked by the impact of the West on Arab civilization—political independence and Arab awakening brought about chiefly through education. Two main trends have resulted in Lebanon: Westernization and nationalism, which hold possibilities both for enrichment and conflict depending upon the course education and Western influences in Lebanon take in relation to the development of a country in which an awakening youth is seeking reasonable ways of meeting life.

In the second part, Dewey's conception of education as life is examined with further investigation of his conception of life as a process of growth resulting from the interaction between the organism (psychological) and the environment (sociological)—a problem-solving process. This is positively problematic as the essence of human nature is also discovered as a dominant emphasis in Lewin (experimental psychologist) and Rank (psychotherapist). An independent reiteration of similar basic concepts is discovered in all three and explained by the study resulting from their common neo-Galilean orientation. The latter is a conscious point of departure in Dewey and Lewin, while Rank uses it at the end to support his theory leading to modifications of the Freudian view regarding human nature formulated out of contacts with patients. Life is neither a morbid process of warring instincts nor an unfolding of a preordained good plan. Growth is an interactive process in which the given person must be understood both in the light of regularity, furnishing some constancy or direction, and flexibility, demanding direction. Education is then perceived as a process of growth when psychological and social needs are understood and met in the manner expressed in the "developmental task" concept of the day.

The Personal and Family Life Needs of College Women with Implications for Education, CATHERINE A. ROCKWOOD, *University of Chicago.* [Miss Rockwood was the AHEA's Omicron Nu research fellow in 1950-51.]

This study investigated in some detail the nature of the personal and family life needs of college women in order to find implications for objectives for the college curriculum. The hypotheses tested grew out of the concept of the developmental nature of human needs and problems. By use of the questionnaire technique the data were obtained from students and alumnae of an accredited, eastern, private, liberal arts college for women.

The data from this investigation show that, in the

terms of the framework set up and in terms of the developmental tasks concept,[1] women have problems in all areas of personal and family life. The study has demonstrated certain areas in which a greater amount of concern is evidenced than in other areas and that the concern is relevant to whether or not the respondent is married. If one uses the anticipation of future concerns as a guide, the data show that nonmarried respondents do not have a concept of their adulthood tasks. They do not anticipate problems in the future with situations which proved to be the sources of problems for the married respondents.

One special emphasis of this investigation was upon the effort to determine what these college women thought about family life education. Did they want education related to the items in the questionnaire? Did they desire information to help solve their problems? The answer was in the affirmative; the respondents showed that they considered such information valuable.

The writer developed the educational implications for the investigation through an analysis of the need for family life education at college level, through a discussion of the specific content of such education for the college curriculum, through an analysis showing that education for family life and liberal arts education are not incompatible, and by a presentation of a way in which an existing program can be reorganized to achieve education for women which is more appropriate and effective.

Managing Your Personal and Home Life, M. CATHARINE STARR, *Teachers College, Columbia University.*

The purpose of this project was to develop a secondary school textbook to assist young people in learning how to manage effectively such human and material resources as personal abilities, relations with others, time, energy, and money.

Preparation of the final manuscript was preceded by extensive reading; by careful observation of adolescents, especially at home and in high school and in college home management residences; and by a collection of reactions from a sample group of teachers and pupils to preliminary drafts as a basis for improving the book's usefulness, appeal, and readability.

The manuscript consists of three sections, each divided into units which contain text, suggested experiences involving co-operative planning and action, supplementary reading, and audio-visual aids.

The first section introduces the study of management through the description of a boy and his experiences in everyday management. The adolescent reader is guided to study the various and common goals of individuals and families, the characteristics of successful management, and the functions and relations of family members in democratic home management.

The second section leads each pupil to develop a critical awareness of his own use of time and energy and the ability to direct both resources toward ends which are satisfying to himself and others. His problems and those of his family in simplifying routine work of the household are considered in the arrangement, care, and use of his own room; in dishwashing, laundering, and cleaning; in placing and using kitchen equipment; in planning, buying, and storing food; in preparing and serving family meals.

The focus of the final section is on financial management. The student is encouraged to analyze problems of personal and family economics; to develop an understanding of the interrelation of his and others' standards and levels of living, a concern for the welfare of others, and the ability to plan and use financial resources in obtaining psychic and economic satisfactions which are essential or desirable.

A Study of the Basic Course in the Division of Home Economics, Oklahoma Agricultural and Mechanical College, WATHENA E. TEMPLE, *Oklahoma Agricultural and Mechanical College.*

This study dealt specifically with the revision of the freshman program in the division of home economics at Oklahoma Agricultural and Mechanical College. The specific purposes of the study were as follows: first, to trace the development of the basic course, or freshman core curriculum in the division of home economics, from its origin in 1943 to 1950; second, to identify strengths and weaknesses for further remedial use; third, to identify those changes resulting from the basic course curriculum; and fourth, to identify problems encountered by the staff in the curriculum revision program.

The basic course of the division of home economics at Oklahoma Agricultural and Mechanical College evolved as an adaptation of general educational practices to the specialized field of home economics. The philosophy and democratic procedures and practices used to formulate the original basic course have deviated, but they are now being reconsidered by the basic course staff. There are four factors that should be considered in the evaluation and further revision of the basic course. First, all faculty members should agree upon a workable philosophy and understand how to implement educational procedures and practices that are consistent with their beliefs. Second, the faculty should agree upon evaluation procedures that will parallel the development of the course. Third, the faculty should devise methods for accurately determining the needs of students and should provide for proper placement of all students. Fourth, the faculty should devise a plan for continuous study and evaluation of teaching practices and the kinds of learning experiences provided for students in terms of their effectiveness in applying the accepted philosophic beliefs.

[1] R. J. HAVIGHURST, *Developmental Tasks and Education.* Chicago: University of Chicago Press, 1948.

A Nutrition Education Programme in Cape Sable Island, JUANITA H. ARCHIBALD, *Teachers College, Columbia University.*

Factors Associated with the Satisfactions of Dietitians in Canada—What Implications for Recruitment? A. ISABEL MACARTHUR, *Teachers College, Columbia University.*

Family Relations: A Text for Filipino High School and College Youth, PAZ P. MENDEZ, *Teachers College, Columbia University.*

Factors Related to the Extent of Mortality among Home Economics Students in Certain Colleges of Minnesota, Wisconsin, and Iowa during 1943-50, HELEN YOUNG NELSON, *University of Minnesota.*

Family Economics–Home Management

Family Savings in the General Economy, MYRA L. BISHOP, *Cornell University.*

Many studies of family expenditures have been made by various government and private organizations but until comparatively recently little attention was given to that portion of the family income which was not used for current consumption items. In this study the writings of some economists and individuals concerned with the economic progress of society and families were examined to find the theories of savings. Certain studies of general economic conditions and family expenditures were examined in an effort to discover the size and distribution of national income and total amount of personal savings, how much families save under various conditions and at different times, and what families do with their savings.

Early economists in most cases tended to stress thrift on the part of the family, not because of what a surplus might do for the family but because the productive plant needed to be expanded. With an increase in productivity, an increase in the level of living was possible and there was then greater concern as to the welfare of families and the division of the product.

All studies have shown that the level of income is the most important single factor in determining the ability to save and the amount saved. Other factors which appear to influence the amount of saving are war and preparation for war, the price level, business activity, availability of consumer goods, what consumers think is going to happen in the relatively near future, recent past experience and events, occupation, ownership of or responsibility for a business, and age and family status.

A Comparison of the Relationships between Income and Meat Consumption in 1942 and 1948, Urban Families in the United States, FAITH CLARK, *University of Chicago.*

The purpose of this study was to compare the relation between income and the consumption of meat of urban families in 1942 with that in 1948. Incident to its attainment was the examination in some detail of the problems involved in the comparison of income-consumption relationships for any commodity in different years using data from cross-section surveys of families. Since such relationships are frequently used for predicting the demand for agricultural goods and as background data for materials in consumer education and family budgets, stability over time becomes a matter of great interest to economists and home economists.

The survey data used in this study, when adjusted insofar as possible for differences in methodology, indicated that there was a difference in the income elasticity of meat consumed by urban families in the spring of 1942 and the spring of 1948, with the elasticity lower in 1948. However, there is a possibility that some of the difference in the observed elasticities may have been due to the effect of different economic conditions upon the relative ranking of families in the two periods and the augmentation of incomes in the later year by wartime savings. The difference may also be explained by a shifting in 1948 to a flatter segment on the income-consumption curve. Only if some or all of the difference in elasticities can be traced to a real shift in the preferences of consumers for meat can the data be interpreted as a trend in consumption patterns. Any definitive answer to the question of whether a lasting change has occurred in meat consumption patterns must await analysis of data from some future survey.

The Significance of Variables Related to Storage Requirements of a Group of Indiana Families, HELEN L. MARLEY, *Purdue University.*

Variables relating to the house, the family, and some housekeeping practices which affect the kind and amount of storage space needed by families living in small urban homes in Indiana were analyzed. The purpose was to discover trends among any of the factors analyzed which might determine whether or not a consistent use pattern exists.

Many types of items found among families when classified according to the variables were similar. Differences occurred mainly between occupational groups in the quantities of such items as evening clothes, work clothes, men's sports clothes, extra furniture, types of table linens, and children's toys.

The age of the mother, which correlated significantly with the age of the father and of the children, was another factor closely related to the types of things families possessed for which storage was required.

On the basis of findings, plans for closets and other storage arrangements of modular unit design were

drawn to accommodate china, crystal, silver, table linens not used daily, bedding, towels, bathroom supplies, personal supplies kept in the bathroom, cleaning supplies, sports equipment and games, miscellaneous items, and clothing. Recommendations were made for varying the amount of space allowed in the plans to meet individual needs. Storage was planned so that it might be built into new homes or prefabricated for already existing homes.

Comparisons of clothing inventories with those of families reported in other recent studies made in the north central part of the United States indicated that the number and types of items possessed were similar in many respects to those of the families in this study. Storage facilities planned for the specific group of families studied in Indiana would be adequate for other families whose characteristics were similar to those observed in the respective studies.

Consumption Levels of Regular Hired Farm Workers, United States, 1940-1950, BARBARA B. REAGAN, *Radcliffe College.*

Changes in consumption levels of regular hired farm workers during the 1940's are sketched by regions, and the levels are compared with those of farmers classified by size of farm business. A broad concept of consumption is used.

The farm workers' consumption goal is here assumed to be the consumption level enjoyed by a group of higher social status living nearby. Consumption levels of their employers, primarily large-scale and large and medium commercial-family farmers, form the upper limit of the assumed goal, and that of farmers operating smaller enterprises in the same areas the lower limit. If a goal is characterized as in the realm of hoped-for attainment, these are reasonable limits for examination.

In terms of wages, perquisites, and security of farm employment, regular hands represent the top stratum of the hired farm working force. In spite of increases, it is not clear that regular hands made any progress toward their consumption goal's assumed upper limit from 1940 to 1950 since their employers' consumption was also rising. During the decade, northern regular hired farm worker families were at the lower limit of their assumed goal—a consumption level similar to that of small-scale or small commercial-family farmers. In the South, the level achieved appears to have been just below that of small-scale farmers and little different from that of many sharecroppers. Western regular hands had a higher level: in 1940 it was similar to that of medium commercial-family farmers, but in 1944 it was closer to that of small commercial-family farmers.

Clothing Inventories of Outerwear of 103 New York Farm Families, DOROTHY MARY KLITZKE, *Cornell University.* [Summarized in Cornell Experiment Station Bulletin 892, Clothing Inventories of Outerwear of 103 New York Farm Families.]

Family Relations and Child Development

The Personal Adjustment of a Selected Group of Widows of Fifty-five Years and Older, GEORGE T. FITZELLE, *Cornell University.*

Seventy-six middle-class widows participated. The questionnaire "Your Activities and Attitudes" [1] was used as an interview guide and furnished a quantitative estimate of adjustment.

Adjustment scores generally fell within the "high average" classification and seemed to have little relationship to age. Product-moment correlations between categories in the attitude inventory of the questionnaire and total score were as follows: health, 0.52; happiness, 0.45; family, 0.44; friends, 0.42; usefulness, 0.42; and so on.

In order to provide an opportunity for decision-making with respect to matters relating to the areas included in the questionnaire, women of the high- and low-scoring groups were given a list of 32 specially selected proverbs. They were asked to evaluate the proverbs according to the extent to which they agreed with them. It was hypothesized that members of the "high" group would indicate certainty in these matters whereas members of the "low" group would react with indecision. Significant differences appeared in the responses of the two groups which tend to support this hypothesis.

Responses of members of the complete sample to two projective-type questions were analyzed according to the basic needs represented. When women were asked to project their thoughts into the future through wishes, they were mainly concerned about health difficulties which might make them dependent. When asked to state the things to which they have to adjust in the present, difficulties with health appear to be relatively unimportant. In the latter response, the need to love and be loved appears to be much more important than any of the other needs.

A Comparison of the Personalities of Children with and without Day Care Center Experience, HENRY S. HASKELL, *New York University.*

Are there significant differences in the personalities of children with one or more years of day care center experience compared with those of children of similar background with no organized preschool experience? Of what do they consist? Might they be attributable to day care center experience?

Twenty first-grade children who had attended day care centers were paired with children with no such experience on age, sex, socioeconomic background, estimated intelligence, parental status, sibling status, ethnic

[1] E. W. BURGESS, R. S. CAVAN, R. J. HAVIGHURST. *Your Activities and Attitudes.* Science Research Associates, Chicago, 1948.

background, race, general health, and parents' employment.

Data on each child were obtained through six observations in varied school situations, three sessions with miniature life-toys, three structured interviews. Each child was rated on a seven-point scale on 54 personality factors. Major areas were: external security; internal security; acceptance; adequacy; sexual adjustment; contact with reality; imagination; attitude toward authority, toward conventions; inhibitions; and over-all adjustment.

For this sample, significant personality differences were discovered which probably were causally related to day care center experience. The following table indicates the major findings:

Summary of findings in major areas studied

AREA	CHILDREN WITH DAY CARE FAVORED	CHILDREN WITHOUT DAY CARE FAVORED	NEITHER FAVORED	NO COMPARISON POSSIBLE
External security	8	4	7	1
Internal security	4	4	9	3
Acceptance	8	1	10	1
Adequacy	5	1	14	0
Sexual adjustment	6	1	12	1
Reality	4	2	14	0
Imagination	6	5	9	0
Authority	7	1	12	0
Conventions	8	1	11	0
Inhibitions	11	2	6	1
Over-all adjustment	10	4	6	0

Kindergarten Children's Control and Acceptance of Same Sex Peers and Their Parents' Control and Acceptance of Them, ELMER M. KNOWLES, *Cornell University.*

This is one of ten related studies at Cornell University concerned with the attitudes and practices of parents in rearing their preschool children.

This study is exploratory, dealing with kindergarten children's attitudes and practices of control and acceptance of their same sex peer playmates and the relationships of these two attitudes to those their parents have to them.

The subjects were the total population of a semiurban kindergarten group in central New York State, 24 girls and 20 boys, ranging in age from four to six.

To obtain a valid measure of the degree of each child's control and acceptance, the investigator observed him 15 times during a three-month period as he interacted with same sex peers in free play and gave him two projective tests using pictures and doll play. The teacher ranked the children on both attitudes. The children were also ranked on six categories of behavior by the investigator. The teacher checked the rankings and complete agreement was reached.

To obtain a picture of the parents' attitudes of control and acceptance, home observations were made of parent-child relationships. In addition to this, a questionnaire was administered individually to each of the parents.

Significant findings are these: (1) There was a high relationship between children's control and acceptance attitudes of same sex peers and their parents' control and acceptance of them. (2) Parents of all the children tended to indicate that they had, by and large, the kind of child they wanted. (3) Control was found to be negatively correlated with acceptance.

The Relationship Between Marital Adjustment and Parental Acceptance of Children, BLAINE M. PORTER, *Cornell University.*

The study is an investigation of the relationship between marital adjustment and parental acceptance of children. The specific aims of the investigation were: (1) to state a more thorough and explicit definition of parental acceptance than exists at the present time; (2) to study the relationship, if any, that exists between marital adjustment and parental acceptance of children; (3) to construct an instrument for measuring parental acceptance; and (4) to test this instrument by administering it to groups of parents.

The data in this study supported the hypothesis that the degree of acceptance which a given parent has for his child exists in measurable form sufficiently to differentiate that parent from other parents. The main hypothesis that marital adjustment is positively related to parental acceptance of children was supported by the data gathered in this investigation. A comparison of total acceptance scores with total marital adjustment scores produced a correlation coefficient of 0.411, significant at the 1 per cent level.

Information regarding the social and economic characteristics of the subjects was gathered and tabulated. Chi squares were computed to test for significant differences between high, middle, and low groups according to acceptance scores. Educational level of the parent was the only one of the socioeconomic factors which these data showed to be significantly related to the degree to which the parent accepted his child.

It was possible to match 18 pairs of husbands and wives and compare their responses to the acceptance scale and the marital adjustment scale. A correlation coefficient of 0.844 was obtained between the responses of husbands and wives to the marital adjustment scale and 0.57 on the acceptance scale, both significant at the 1 per cent level.

Other contributions of this study include the definition of parental acceptance and the parental acceptance scale which was developed.

An Investigation of Conditions Affecting Transposition Behavior in Preschool Children, GLENN TERRELL, JR., *State University of Iowa.*

The purpose of the present investigation is to study the effects of certain conditions on the extent to which

preschool children generalize (transfer) the concept of "middle-sized" from one situation to another.

Forty-eight children, ranging in mental age from 3 years, 0 months, to 6 years, 9 months, were constituted into four mental age levels. The subjects in each level were assigned at random to four treatment groups, which differed from each other with respect to the type of preliminary training administered, as well as in some of the instructions given during the tests for transposition. Treatment group I was given only specific training to the middle-sized stimulus, while treatment groups II, III, and IV were given both specific and general training to respond to the middle-sized stimulus in a three-stimulus problem. (*Specific* training refers to training to the middle-sized of cube boxes only, while *general* training refers to training to the middle-sized of three different geometric forms—circles, triangles, and trapezoids.) Furthermore, treatments III and IV differed from treatment II in that the former treatments were given a concept name ("Dag") for the middle-sized stimulus, the subjects of treatment IV being required to say the concept name.

Appropriate analysis of the transposition test data lead to the following results: (1) Subjects given both specific and general training to the middle-sized stimulus transpose more consistently than those subjects given only specific training. (2) Transposition is in part dependent upon whether or not the subject has a concept name available for the concept "middle-sized." (3) Those who comment on the change of boxes prior to the transposition test tend to transpose less consistently than those who do not make such a comment.

Foods and Nutrition

Effect of Cooking Temperatures on the Quality and *in Vitro* Digestibility of Beef Stews and Pot Roasts, Ellen B. Freeman, *University of Minnesota.*

Various authors disagree as to the effect of heat on the nutritive value of meat proteins. The present study was planned to determine quality and *in vitro* digestibility of pressure-cooked and of braised beef stews and pot roasts. Raw meat was compared where possible.

The beef was top round of Commercial grade. Pressure-cooked stews and pot roasts were cooked at 117.5°C—stews for 18 minutes, pot roasts for 30 minutes. Conventionally cooked stews were cooked at the boiling point of water for 1½ hours, pot roasts for 3 hours. Iron-Constantan thermocouples were used to measure the temperature within the pans and to follow the course of heat penetration in the meat. Weight losses during cooking were calculated. Cooking broths were analyzed for amino nitrogen and total nitrogen.

Objective tests for quality were shear force determinations (tenderness) and press fluid tests (juiciness). Conventional pot roasts showed significantly lower shear force readings than raw or other cooked meats. All cooked beef gave highly significantly less press fluid than raw beef. Pressure-cooked and conventional stews were not significantly different in press fluid, but pressure-cooked pot roasts yielded significantly more press fluid than conventionally cooked roasts. Pot roasts gave highly significantly more press fluid than stews.

Samples of beef from each cooking series, with comparable samples of raw beef, were subjected to *in vitro* digestion as follows: (1) pepsin alone; (2) pepsin followed by trypsin; or (3) pepsin, then trypsin, and then erepsin. Total nitrogen, amino nitrogen, and acid-insoluble residue nitrogen were determined. For both stews and pot roasts, variations in degree of digestion due to extent or method of cooking were nonsignificant. The mean degree of digestion for pot roasts was highly significantly lower than for stews. More acid-insoluble residue nitrogen resulted from pepsin digestion of raw beef than of cooked beef, while with pepsin-trypsin and pepsin-trypsin-erepsin combinations cooked beef yielded more residue nitrogen. Pressure-cooked and conventionally cooked meats gave similar amounts of residue nitrogen.

Studies on Amino Acids in Self-Selected Diets, Mary F. Futrell, *University of Wisconsin.*

A survey has been made of the amounts of amino acids consumed by average women in the course of an ordinary day. Determinations were made for the ten essential amino acids by microbiological methods on a composite sample of the foods and on separate groups of foods. The total intake of amino acids always appeared to be greater when determinated on separate foods than on composites, the greater discrepancies being with lysine, methionine, and tryptophan. In the presence of carbohydrate-rich foods, recoveries were low for the above amino acids.

The amounts of most of the amino acids consumed by the four subjects were found to be higher than the levels recommended by Rose [1]; however, methionine and phenylalanine appeared to be limiting. The adequacy of the diets was determined by a measurement of nitrogen balance. Two of the four subjects were in negative balance for two 5-day periods.

In a second study, 18 amino acids were determined in the diets of five subjects. Again methionine appeared to be limiting. The amount of cystine contributed very little to the "total methionine" of the diet; however, tyrosine contributed a substantial amount to the total phenylalanine. In a third study, eight essential amino acids were measured in the separate meals of three subjects. No clear connection was established between nitrogen balance and the amino acid composition of the separate meals.

Improvements were attempted in the determination of certain amino acids in foods. New media are given

[1] W. C. Rose, Amino acid requirements of man. *Fed. Proc.* **8** (1949), p. 546.

for the determination of amino acids by *Leuconostoc mesenteroides* P-60 and *Leuconostoc citrovorum* 8081.

Organoleptic, Histological, and Chemical Characteristics of Fresh and Frozen Stored Turkey Fed on High-Density and Low-Density Rations, GRAYCE E. GOERTZ, *Kansas State College.*

Broad-breasted bronze turkeys were fed two types of rations: one group received a low-fiber, high-density feed and the other a high-bulk, low-density ration. Turkey steaks were cut from the breast and leg portion of one-half of each turkey and stored at 0°F; the other half of the bird was roasted fresh. A histological study of the muscle fibers, fat, and elastic and collagenous connective tissue of the *pectoralis major* and *gluteus primus* muscles was made.

Turkeys fed the high-density rations were given a higher average preference rating for both the roasted halves and the cooked steaks. Aroma and flavor scores for the roasted turkey were higher for the birds on the high-density ration. These birds also contained larger amounts of intramuscular fat. Steaks from turkeys fed the high-density ration had higher juiciness scores and the fat showed lower peroxide oxygen values. Roasted halves of turkeys fed the low-density feed had higher juiciness scores, greater volume of press fluid, and smaller percentage total cooking losses.

Histologically, the *pectoralis major* muscle fibers showed a fragility resembling a worn textile, disintegration strips, and some breaks. The *gluteus primus* muscle contained more rigor nodes and fewer breaks but also had some disintegration fissures and strips. More intramuscular fat and larger amounts of connective tissue were observed in the *gluteus primus* muscle.

Aroma and flavor scores for the turkey steaks decreased with an increase in the length of storage, with aroma scores decreasing more than flavor scores. Steaks from the birds on the two rations apparently had equal keeping quality and were still acceptable at the end of eight months of storage.

Some Properties of Selected Edible Starches as Thickening Agents and Changes Induced by Sucrose, E. ELIZABETH HESTER, *Cornell University.*

The water pastes of 3 nongelling waxy starches, 1 corn starch, 5 wheat starches, and 2 wheat flours were studied relative to their physical properties. The effect of increasing concentrations of sucrose on the paste and gel properties of some of these thickeners was also studied. The physical properties included gelatinization characteristics and viscosity of the pastes at different rates of shear, and rigidity, elasticity, breaking point, and syneresis of the gels. The amount of soluble material and amylose leached from the granules during heating was determined, and microscopic measurements and observations of the starch granules were made.

The concentration of the thickener used was determined by the amount necessary to give a gel of standard rigidity or, for the nongelling starches, a hot paste of standard viscosity.

The proposed hypothesis that less hydration of starch granules occurs when starch is gelatinized in sucrose solutions than in water alone is supported by the following evidence: (1) a higher temperature for the first perceptible rise in viscosity, (2) a lower maximum viscosity of the pastes, (3) less disintegration of the granules, and (4) less soluble material diffusing from the starch granules.

The proposed hypothesis that less amylose is available for gel formation when starch is heated in sucrose solutions rather than in water alone is supported by the following evidence: (1) a decreased rigidity of the gels, (2) a decreased deforming stress and stress required to break the gel, and (3) a decreased amount of amylose in solution.

The behavior of the pastes and gels of flour could not be adequately explained by the behavior of the starch from that flour.

Studies on the Growth of Food Poisoning Micrococci on Cooked Ham Under Conditions of Home Preparation and Storage, MAXINE E. MCDIVITT, *University of Wisconsin.*

The object of this study was to investigate the growth of food poisoning micrococci on ham under conditions encountered in home food handling. Cooked ham was inoculated with an enterotoxigenic strain of *Micrococcus pyogenes* var. *aureus.* The samples were then stored at 4°C and at 30°C for varying lengths of time and examined for bacterial development. Results indicated that no marked change in bacterial count occurred at 4°C for as long as 14 days. At 30°C, however, there was rapid cell multiplication between 3 and 18 hours. Such samples gave no indication of their unfitness for food.

While there is at present no convenient reliable test for the presence of enterotoxin, it has been established that the formation of this substance is a function of growth. This study has shown that rapid bacterial growth occurs on artificially inoculated ham under conditions of time and temperature frequently encountered in the handling of this food. It may be assumed that similar performance could be expected of micrococci which survived the cooking process or of similar organisms inadvertently introduced by coughing, sneezing, or by contact with contaminated hands or equipment. The presence of enterotoxigenic strains presents a health hazard unless careful attention is given to prompt refrigeration.

Other phases of the problem investigated were a comparative study of media for the selective isolation of micrococci and a study of the relationship between salt tolerance and heat tolerance of micrococci. Preliminary results of the latter study indicate that cells cultivated in the presence of the ingredients of pickling brine exhibit increased thermal resistance.

A Study of the Effect of Certain Management Factors on Nutritive Values and Pupil Participation in the School Lunch, JESSIE C. OBERT, *Ohio State University.*

Changes in nutritive value and pupil participation following changes in practices and policies of school lunch management were studied in 13 Ohio lunch rooms during one school year. A special objective rating device was developed for use in numerical rating of these practices and policies.

Management practices in the subject schools were rated during an initial survey in the autumn. A series of educational programs was then conducted to improve certain practices believed to affect nutritive value and pupil participation. At the end of the school year the rating was repeated in a final survey. Analysis and comparison of the data indicated that:

1. The mean scores for the schools as a group were significantly greater after the educational programs than before them.
2. The number of schools meeting the food requirements for the Type A lunch increased from three in the initial survey to six in the final survey.
3. There was some improvement in nutritive value of the lunches although changes were not significant.
4. During the final survey the higher cost lunches were more nutritious than the lower cost lunches.
5. Some increase in nutritive value appeared to accompany improvement in practices as shown by school scores.
6. There was no relationship between score and participation.
7. Participation decreased less during the study year than during the same period of the previous year.

The Changes in Pectic Substances of Tomatoes During Storage, ELIZABETH F. STIER, *Rutgers University.*

The effect of storage at 40°F on the pectic constituents of nine lots of Queens variety tomatoes was studied throughout a 21-day storage period. An over-all decrease in protopectin was found and an increase in pectin was observed. Pectate did not change in a uniform manner.

The time interval of harvest appeared to have some influence on the uniformity of changes in the pectic substances during storage. Five lots which were harvested within one week when grouped as replicates showed a definite correlation between changes in pectic substances and increased storage time. With pectin the coefficient of correlation was +0.57, which meant that 57 per cent of the change in pectin could be associated with increased storage time. Protopectin had a coefficient of correlation of −0.811, which meant that 81.1 per cent of the decrease in protopectin could be associated with increased storage time. Tomatoes harvested within one week showed a more consistent pattern of change than those harvested throughout a six-week period.

Depolymerization, or decrease in molecular size, of the pectic substances present in tomatoes on various sampling days was indicated by a decrease in the relative viscosity of solutions of the pectic fractions.

The decrease in protopectin was the most important change observed during storage of tomatoes. The data indicate that pectic substances may be changed to substances which are not detectable by the methods used. The decrease in protopectin and the increase in pectin is related to the softening of tomatoes.

The Effect of Three Levels of Fat in an Isocaloric Diet on Calcium Metabolism in College Women, MARY E. FUQUA, *Ohio State University.* [Miss Fuqua was AHEA's Evaporated Milk Association Fellow in 1950-51.]

The Nutritional Evaluation of Certain [Indian] Nut Proteins, SUSHELA LINGAIAH, *Michigan State College.*

The Effect of Various Factors on the Niacin and Pyridoxine Content of Cooked Potatoes, EDNA PAGE, *University of Wisconsin.*

Housing and Household Equipment

Methods for Studying the Home Management Aspects of Kitchen Storage Space for Farm Homes, JESSIE JULIA MIZE, *Cornell University.* [See February 1953 JOURNAL for article based on this thesis.]

Institution Administration

Management Aspects of and Educational Criteria for School Lunch Programs in Iowa, BEATRICE DONALDSON, *Iowa State College.*

During the school year of 1948-49, data regarding management aspects of lunch programs were collected in 25 Iowa schools chosen at random. The results of this portion of the study will be reported as a part of a regional school lunch research project.

The purpose of the second part of the study reported here was to develop a set of criteria which can be used to determine to what extent a school lunch program is an integral part of the total school program. After developing a concept of the basic characteristics of such a program, the following criteria were proposed: there are sound policies for the administration of the school lunch program; the school administrator assumes responsibility for the administration of the program; teachers assume and share responsibilities for promoting the educational effectiveness of the program; pupils participate in educational activities related to the program; and the professionally trained manager and the school lunch personnel contribute to the educational effectiveness of the program.

A schedule, which was developed for obtaining data believed to be necessary for determining to what extent the proposed criteria are fulfilled in a given school, was tested in ten schools. The revised schedule elicited the information believed to be necessary, was applicable to various types of schools, and seemed to provide a practical basis for this kind of evaluation.

The schedule was recommended to determine the extent to which a school or group of schools is fulfilling the criteria, to secure some knowledge of the attitudes of schools and communities regarding the educational potentialities of lunch programs, to determine needs for assistance in planning methods whereby the criteria can be more completely fulfilled, and to suggest possibilities which exist for making the lunch program educational.

NEWS NOTES

STATE ACTIVITIES

ALABAMA. Family centered research studies in process at Alabama Polytechnic Institute include a study of relationships within the extended family, evaluation of the social roles of young people, and developmental factors associated with creative interests of home economics majors.

Studies in farm family earnings and money management are being made by the Alabama Farmers Home Administration as part of collective studies made on a national basis.

In the research laboratory of human nutrition at the University of Alabama studies are in progress on human utilization of ascorbic acid in southern-grown fruits and vegetables (under contract with the Bureau of Human Nutrition and Home Economics), animal metabolism studies on ascorbic acid–folic acid relationships, influence of ingested dehydroascorbic acid on blood levels of ascorbic acid in human subjects, and methods of teaching nutrition to high school and lay groups.

The research laboratory of the department of clothing, textiles, and related art at the University is continuing its studies on lightweight cotton corduroy begun in 1945. Two bulletins have been published, and two papers and an abstract have been reported in the JOURNAL.

A serigraph, to test yarn breaking strength and elongation, has been added to the conditioning room equipment.

ALASKA. Christine Heller, after spending two summers collecting and classifying more than 100 edible plants of Alaska, has prepared the booklet "Wild Edible Plants of Alaska." The study was sponsored by Arctic Aeromedical Laboratory at Ladd Air Force Base for use in the military manual on arctic survival. The booklet will be published by the Alaska Extension Service for civilian use.

Miss Heller is extension specialist in food resources of Alaska stationed at the Fishery Products Research Laboratory in Ketchikan. She has nearly completed her work for a doctorate at Cornell University, where her research problem was the vitamin value of arctic fish oils. She is now compiling a manual on home preservation of fish.

The high cost of living in Alaska is verified by Hugh Johnson, resident agricultural economist, who maintains a continuing study of comparative costs of a list of foods commonly used by Alaskan families. Home demonstration agents are co-operating in the collection of data for the study. Reports of the research are published by the Alaska Experiment Station at Palmer.

ARIZONA. The orientation course for new Navajo students at the Phoenix Indian School has as its objective learning the good ways of the white man so that they may be combined with the good ways of the students' own people. Everyday living at the school provides practice opportunities in classrooms and in social and community life. A family dining hall has been arranged where family-style service is used at tables for eight.

A collection of Toby jugs and jar lids representing Victorian England has been presented to the School of Home Economics at the University of Arizona by Mrs. Eugenia Stanley.

Mazalene Altman, formerly of the University of Wisconsin, is the clothing instructor at the University of Arizona who has succeeded Edith Ranney, now retired.

Anne Shute has succeeded Mrs. Izola J. Parker as home demonstration agent in Navajo and Apache Counties.

When Rua Van Horn of the U. S. Office of Education spent the week of November 17 in Arizona, administrators, teachers, teacher trainers, parents, and members of the vocational homemaking staff gathered to evaluate the total homemaking program. The emphasis in 1953 will be on the in-service training program.

CALIFORNIA. Research studies now under way at the University of California, Berkeley, include:

In foods and nutrition: The dough qualities of flours of various extractions when combined with nonfat milk solids prepared at various temperatures, and the nutritive value of the breads so prepared; the browning reaction in heated milk proteins and the value of these proteins in reproduction and lactation; the effect on carbohydrate and fat metabolism in rats and dogs as the result of damage to the adrenal glands of dietary deficiency of pantothenic acid or riboflavin; the relation of dietary protein to the fate of food cholesterol; and isolation and identification of flavoring material in tomatoes.

On nutritional status: Examination of 300 of the persons 50 years and older who co-operated in the nutritional status study in 1948-49 in the first re-check of the group to determine the progressive changes in food habits and physical and biochemical changes with increased aging.

In consumer economics: Articles on various phases of the study of consumption of dairy products in Oakland and Los Angeles published in the October, November, and December issues of *California Agriculture.*

In child development: Completion of studies of young children's responses to persons of different skin colors in California.

In family relationships: The effect of marital dissolution upon the children in the family; background factors relating to maturation and dating.

DISTRICT OF COLUMBIA. Travel-by-proxy night at the December meeting of the HEIB group of the D. C. Home Economics Association included a talk entitled "At Last I Got to Paris" by Ida Jean Kain. Armed with authentic information on Parisian restaurants, she tried to "do" all of them in a couple of weeks. To spread a bit of Christmas cheer, members brought gaily wrapped gifts to be sent to the girls at the Industrial Home School of Washington.

Use, etiquette, and care of flowers was the theme of an illustrated talk by Mrs. Clova Demaine at the December meeting of the homemaking department of the D. C. Home Economics Association held at AHEA headquarters. The making of effective, inexpensive Christmas decorations for the home was demonstrated.

GEORGIA. Research in progress at the University of Georgia includes a co-operative study of quality factors and nutritive value of grass-fed Georgia beef by the School of Home Economics and the Experiment Stations.

The consumer's stake in the graded broiler market in Georgia is being investigated as a joint project between the School of Home Economics and the agricultural economics department of the College of Agriculture.

A study of the problems in dress of women 45 to 65 years of age is continuing in the department of clothing and textiles. A recent article relating to this study was prepared by Mrs. Margaret H. Blair for the U. S. Department of State publication *America*, printed in Russian and distributed in Russia. Problems experienced by women in the use of ready-made suits and coats also are being studied.

Functional space requirements for storage and work in rural homes are being investigated in the department of housing and home management as a 5-year project in co-operation with the department of agricultural engineering.

A study to compare the ultimate cost and time spent on six types of window dressings for bedroom windows is being conducted at the four home management houses.

The department of family and child development is continuing to study patterns of guidance and control parents use with children aged 3 to 5 years.

Recent graduate studies included one of the home backgrounds of freshman home economics students at the University and one of home responsibilities of children aged 2 through 5 years.

A study of the effect of alcohol on growth, fecundity, and voluntary consumption in mice was recently completed.

IDAHO. Home economics research at the University of Idaho includes the final stages of analyzing data and preparing reports on the Idaho phase of the Western Regional Nutritional Status Project, Nutritional Status and Dietary Needs of Population Groups in Selected Areas of the West. An unusual range of variation in soil, water, and climatic factors in Idaho warranted a study of the relationship of environmental conditions and diet to dental health.

A study of the physiological availability of the thiamine in certain Idaho products is also being made. Human subjects and experimental animals are being used, and the foods being studied are lamb and potatoes.

Mildred Haberly, recently Extension Service nutrition specialist, has been promoted to state home demonstration leader. She succeeds Leatha Christensen Poncia, who served in an acting capacity after the retirement of Marion Hepworth.

Lucille Magruder, for 12 years on the University of Idaho staff, joined the home economics education staff at the Delta State Teachers College, Cleveland, Mississippi, in January.

Shirley Bring joined the home economics research staff at the University of Idaho in July 1952 as assistant home economist. Her experience has been as an industrial chemist, hospital dietitian, marketing specialist with the U. S. Department of Agriculture, and field nutritionist in the Western Regional Nutritional Status Project.

ILLINOIS. A two-year, statewide research project on "Cultural Factors Influencing Girls' Election of Home Economics Courses in Illinois High Schools" was initiated by Letitia Walsh through the Bureau of Educational Research at the University of Illinois in September. The state research committee in home economics education has been reactivated to offer advisory service on projects. Members are Letitia Walsh, Rena Hodgen, Eileen Quigley, and Marie Dirks.

The January 1953 issue of the Research and Development Associates *Activities Report* (Vol. IV, No. 4) contains a summary of the outside contract research findings in the Armed Forces food and container program for 1952 and of the applicability of these findings to ration improvement.

The October 1952 issue of the *Report* (Vol. IV, No. 3) contains an account of the nutritional composition of mass menus.

Copies of the *Report* or reprints of articles are available in limited supply free of charge from Research and Development Associates, 1849 W. Pershing Road, Chicago 9, Illinois.

A conference on browning was held at the Quartermaster Food and Container Institute during 1952. It was a complete survey of the current QM-sponsored work on this complex deteriorative process.

IOWA. Two scholarships for college training in home economics are to be offered to Iowa high school graduates by the Iowa Home Economics Association, commencing in 1953, according to plans completed by the Association's scholarship committee, headed by Mary Lyle. The scholarships will be supported by royalties from the book *The Unit Method of Sewing* and such other money as the executive council of the Association determines.

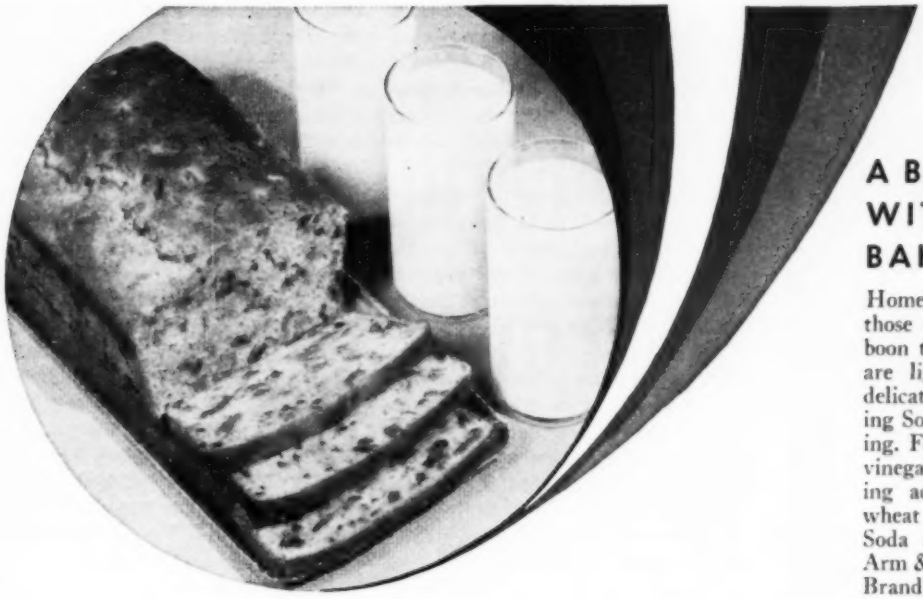
KANSAS. The First Kansas Food Institute, sponsored by the Kansas Restaurant Association and the Kansas Hotel Association, was held from January 8 to 10 at the University of Kansas. Patricia Beezley, owner and manager of the Pennant Cafeteria in Topeka, was a member of the planning committee. Speakers included Professors Wanderstock and Erickson from Cornell University and Professor Bernatsky from the University of Denver along with specialists from Missouri and Kansas.

Mrs. Jean Chen Lin, former AHEA international scholarship student at Kansas State College, and recently research assistant in the department of foods and nutrition there, resigned the first of the year to join her husband at Cornell University, where she expects to do laboratory work in the department of foods and nutrition.

LOUISIANA. "Strengthening Values in Family Life—A Step Toward World Understanding" was the theme of the annual meeting of the Louisiana Home Economics Association held in New Orleans on November 24 and 25 in connection with that of the Louisiana Educational Association. A high light of the meeting was the panel discussion during which the panelists, all world travelers who had worked with homemaking and agricultural agencies in different countries, stressed the value of strengthening home and family life in the interest of world peace.

A study of the home economics program in Louisiana was made early in November by Ata Lee of the U. S. Office of Education, with the assistance of the home economics staffs of the colleges, Louisiana State University, and the State Department of Education.

Mrs. Dorothy Moschette, associate home economist in the Experiment Station at Louisiana State University, participated in the nutrition status



A BETTER WAY WITH BAKING SODA

Homemade quick loaf breads—those favorites that are such a boon to the busy homemaker—are lighter, more tender and delicate when made with Baking Soda and vinegar as leavening. For both Baking Soda and vinegar have a specific tenderizing action on the protein of wheat flour. Let the Baking Soda used in your classes be Arm & Hammer Brand or Cow Brand Baking Soda, and know you are using only pure bicarbonate of soda of highest quality, every time.

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APRICOT NUGGET BREAD (Yield: 1 loaf)

1 cup dried apricots, cut in small bits
½ cup hot water
2½ cups sifted all-purpose flour
1¼ teaspoons Arm & Hammer Brand or Cow Brand Baking Soda
1 teaspoon salt
½ cup sugar
¼ cup white (distilled) vinegar plus apricot water and milk to make 1 cup liquid
2 eggs
¼ cup melted shortening
½ cup chopped nuts

Cover apricots with hot water; soak 1 hour. Sift flour, Baking Soda, salt, and sugar together. Measure vinegar, add water drained from apricots and milk to make 1 cup liquid. Beat eggs, and to them add liquid, apricots, shortening. Add all at once to dry ingredients; stir until flour is dampened; stir in nuts. Turn into greased 8¾ x 4½ x 2½-inch loaf pan. Bake 60-70 minutes or until done at 350° F. (moderate oven). Remove from pan; cool several hours or overnight.

TIPS TO TEACHERS

Most quick loaf breads are made by the muffin method, using all-purpose flour. Thus it is important to avoid overbeating of the batter, which tends to produce tunnels, reduce tenderness. Batter should be barely mixed, not smooth; it will look lumpy, but baking takes care of that. And remember that it is the new Baking Soda and vinegar formula (see recipe) which assures success when substituting sweet milk and vinegar for the older-fashioned sour milk, now not always readily available.

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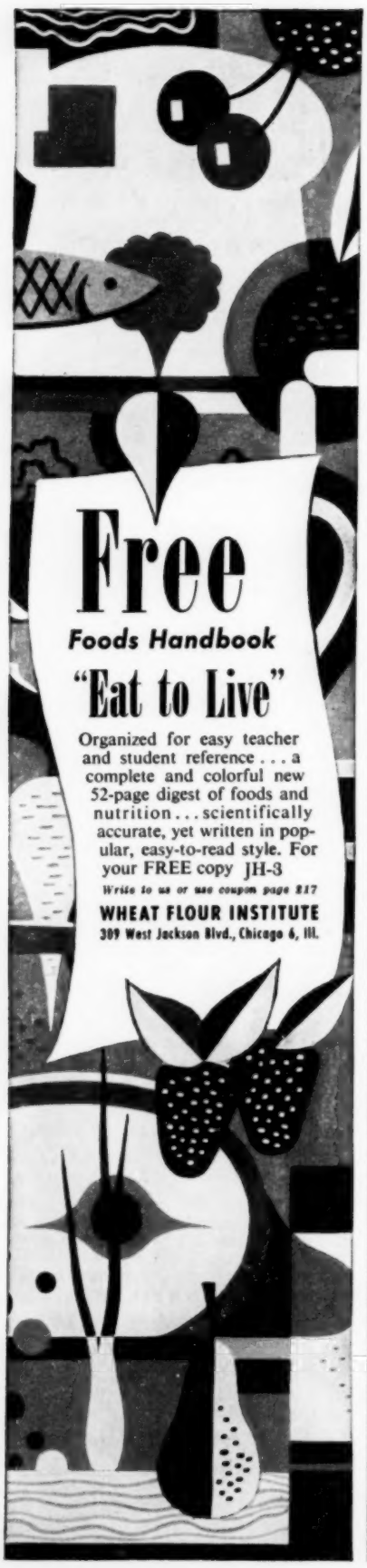
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section of the National Food and Nutrition Institute in December in Washington, D. C.

MISSOURI. The research program being carried on at the University of Missouri includes the following projects:

In nutrition: A three-year study of food intake and dietary habits of older women in Missouri is nearing completion as part of the regional study of nutritional status and dietary requirements of older women.

In foods: One major project that is part of "studies to promote utilization of processed food and food improvers" has three subprojects–one dealing with development of recommendations and recipes for enrichment of foods with nonfat milk solids, one concerning bacteriological studies made on the effect of temperature and acidity on the survival of food poisoning agents in products made with dried egg, and one that is an evaluation of the enzymatic activity of various meat tenderizers on the market. A second major project consists of (1) a continuation of the study of factors influencing change in meat pigments on storage and (2) development of recommendations for preparation of food products with high nutritive value and fresh flavor by means of the mechanical blender.

In textiles and clothing: A study of curtain marquisettes is concerned with "The Serviceability of Five Cotton Marquisettes with Ordinary and Special Finishes" and "The Effects of Laundering on Cotton, Rayon, and Nylon Marquisettes with Special Finishes." Other studies include: "A Study of Two Cotton Fabrics Given Home-applied Starch-like Finishes," "The Effects of a Home-applied Fire-retardant Finish on a Group of Cotton and Rayon Fabrics," and "Consumer Dissatisfactions in Textile Products."

In the area of family life: A survey is being made of reactions of home economics freshmen to personal and family life situations to determine the relationship of student reactions and personal characteristics to the economic, cultural, and social levels of their family environment; to provide one basis for evaluation of teaching methods in the area of family life; and to participate in a national project of testing standardized personality tests.

NEVADA. The Nevada Nutrition Council is planning to reorganize in order to include more agencies than are now represented. Mrs. Gertrude Hayes is the Council's chairman.

Maybelle Eager, formerly with the California Extension Service, is now state leader of home demonstration work and specialist for the Nevada Extension Service and lecturer in nutrition at the University of Nevada.

Mrs. Chrissie Kellogg is the new state supervisor of the school lunch program under the Department of Education in Carson City.

NEW MEXICO. "Human Relationships in the Homemaking Program" was the theme of the New Mexico Conference of Homemaking Teachers at New Mexico A & M College in August. Mrs. Mildred Weigley Wood, co-ordinator of homemaking education at the Phoenix (Arizona) High School, was the leader.

A "Heart of the Home" kitchen was set up at the 1952 New Mexico State Fair by the Bernalillo County Extension Council in co-operation with the New Mexico Heart Association.

Home demonstration work which began two years ago on the Navajo-Hopi Indian Reservations is enabling Indian homemakers to learn scientific methods of food preservation and storage.

The nutrition class at New Mexico Highlands University helps with special diets at three hospitals and the Meadows Home for Aged in Las Vegas.

Veda Strong, a member of the New Mexico Extension Service staff since 1925 and home management specialist since 1940, died on October 17 at Colorado Springs.

Margaret O'Loughlin, head of the department of home economics at New Mexico A & M College for 26 years, retired on February 1. The new home management house, which is nearing completion, will be named in her honor.

NORTH CAROLINA. A research project on the use of nonfat dried milk in favorite southern recipes, begun in 1948 in the foods and nutrition department of the Woman's College of the University of North Carolina, has been released to the public in the form of a recipe booklet, "Southern Recipes Featuring Starlac." Copies may be obtained from the Starlac Division, The Borden Company, 285 Madison Avenue, New York 17, New York.

NORTH DAKOTA. Tilda Natwick, who retired this year as head of the home economics department at

the University of North Dakota, was presented with a life membership in the American Home Economics Association by former students and associates at a banquet in her honor. She is now living in Veriqua, Wisconsin.

Co-operation of home economics teachers with other groups in the community was one of the emphases of the one-day workshop on adult education conducted by Rose Cologne of the Pennsylvania State College prior to the annual meeting of the North Dakota Education Association in Grand Forks. The workshop was sponsored by the State Vocational Home Economics Department.

"Topic Trends in Adult Education" was the subject of Dr. Cologne's talk to the home economics section of the North Dakota Education Association during its 1952 annual meeting.

OREGON. The launching of a $200 scholarship to be named "The Oregon Home Economics Association's Career Scholarship" has been undertaken this year by members of the Association. It will be awarded on the basis of the girl's interest in and knowledge of a career in any of the many areas of home economics and upon her well-rounded record of studies, activities, and home work, according to Mrs. John Wieman, Association president. Recipients of the scholarship will be required to attend an Oregon college granting a degree in home economics.

This scholarship will replace the $25 previously awarded annually to a sophomore enrolled in home economics at Oregon State College. Mrs. Rita Calhoun, chairman of the Association's scholarship committee, states that this new project is aimed at creating interest in home economics among the general public. It is also to be used as a recruitment tool by giving special publicity to the departments of home economics in Oregon high schools.

In conjunction with publicizing the careers in home economics, the Association has just published an illustrated brochure titled "Careers in Home Economics," which has been distributed to high school home economics teachers throughout the state.

PENNSYLVANIA. "Fashions, Fabrics, and Families" will be the theme of the Home Economics Spring Week End on April 17 and 18 at the Pennsylvania State College. To help those attending answer clothing

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and textile questions, the School of Home Economics will bring together specialists from industry, retail stores, consumer groups, and from the College's own laboratories. Faculty members, extension workers, students, and alumni will add to the program. All users of textiles are invited to attend.

TENNESSEE. Research projects of the College of Home Economics at the University of Tennessee include the following:

In *child development and family relations,* two master's theses are being planned to contribute to the Southern Regional Family Life Project. These will center about the study of the attitudes and beliefs of rural people in regard to child rearing.

In *foods,* a paper on "Flavor Deterioration in Frozen Cake Batters" appeared in the first 1953 issue of *Food Research.* This paper is one of a series resulting from tests of the effects of freezing on the properties of batter and dough products.

In *home management,* the University, in co-operation with the Tennessee Valley Authority, is starting a research program on the "Adaptability of Electricity to Southern Homes."

The University is co-operating in the Southern Regional Housing Project entitled "Functional Requirements and Facilities for Southern Homes." The focus of the University subproject is "The Analysis of Space Requirements for Meal Preparation and Service."

"Rural Family Spending Ways," a state study of the income and consumption of open country farm families, will be published soon.

In *nutrition,* the nutrition department is working on problems of calcium utilization. Human experiments are concerned with utilization of calcium and other nutrients in diets lacking in milk, eggs, and wheat and interrelationships of calcium with other constituents in these diets. Comparative studies are being made on the utilization of calcium and other nutrients when the restricted diet is supplemented with decalcium phosphate and riboflavin and when the natural foods are added. Animal experiments on calcium utilization are in progress also.

In *related art and crafts,* "Some Recent Contributions of the Cherokee Indians of North Carolina to the Crafts of the Southern Highlands" and "A Study of Weaving Techniques of 81 Contemporary Handweavers Exhibiting in the International Textile Exhibitions, 1944-50" are titles of recent master's theses.

Work has started on a study sponsored by the Tennessee Home Economics Association to determine the practices of Tennessee people and their needs for more training in related art. A pilot study is under way.

In *textiles and clothing,* a study of Tennessee cotton is being carried on to determine effects of fiber properties upon yarn and fabric properties with special emphasis on fabric serviceability.

A marketing study dealing with "Consumer Preferences in Buying Selected Clothing Items" is being made in the East Tennessee area to check on satisfactions received from certain clothing purchases by interviews made at six-month intervals.

WASHINGTON. Barbara A. McLaren of the State College of Washington is using a colony of cockroaches, *Periplaneta Americana* (Linn.), for assays of the biological value of proteins, minerals, and vitamins. Dr. McLaren reports that the roach is able to measure both quality and quantity of the protein and in mineral metabolism appears to be as sensitive to changes in phosphorus levels as is the chicken. Attempts are being made at the College to develop a ratio for optimum growth and survival.

Ailsie M. Stevenson of the State College of Washington and assistant state supervisor of home economics completed research recently on "The Cost of an Adequate Food Preparation Program." High school curriculum committees worked out a series of food preparation experiences which were deemed adequate, and teachers kept records of the costs. The results will be used as the basis for planning food programs and budgets.

WEST VIRGINIA. The West Virginia State Nutrition Committee has changed its name to the West Virginia State Nutrition Council. At a recent meeting John B. Youmans, MD, dean of the School of Medicine at Vanderbilt University, spoke on "Mineral Deficiency Diseases."

The State Health Department now has three nutritionists who are spending full time in nutrition work.

A new home management house is being equipped by the home economics department at West Virginia University. The home economics students are planning the furniture and furnishing for two apartments—one modern, the other traditional.

WISCONSIN. Typical current research studies of the School of Home Economics at the University of Wisconsin in *foods and nutrition* include: the nutritive value and eating quality of potatoes; the relation of the rate of heat transfer in meats to juiciness; the survival of certain food poisoning organisms in ham loaf and ham croquettes; the effect of freezing on food poisoning organisms in frozen sandwiches; determinations of the thiamine and riboflavin needs of adolescents and older women; the influence of yeasts on biotin metabolism; long-term nitrogen balance studies on self-selected diets; folic acid, the citrovorum factor and vitamin B_{12} in relation to each other and other factors in the human diet; and the effect of some micro-organisms in the digestive tract on the availability for absorption into the blood of certain vitamins.

Current research *in home management and family living* is concerned with devising measures of adult sensitivity or empathy for young children and the influence of selected economic, social, and geographical factors upon housing needs of rural families as a basis for housing improvement.

In *textiles and clothing* studies of the relationship between the chemical nature and the activity of several types of surface-active agents and of problems confronting the home-sewer constructing garments of Dacron and Dacron-nylon warp knit fabrics are under way.

WYOMING. A two-week Family Life Workshop, carrying 2 hours' credit, will be conducted by the home economics department of the University of Wyoming from June 15 to 26 under the direction of Mrs. George Gillespie and Mrs. Verna Hitchcock. One feature will be a two-day Family Living Conference on June 17 and 18, sponsored by the Wyoming Federation of Women's Clubs, the Wyoming Congress of Parents and Teachers, the women of the Farm Bureau, and the Wyoming Home Demonstration Council. The Division of Adult Education and Community Service is also co-operating in organizing the conference. Camilla M. Anderson, MD, Salt Lake City psychiatrist, will be the featured speaker of the two-day session. She will discuss "Emotional Maturity" as the basis for good human relations and the part the home plays in developing emotional maturity.

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TEACH IN CHICAGO

Examinations for teachers of Home Making Arts in the Chicago Public High Schools will be held April 27, 1953.

Closing date for filing formal application forms and required credentials is April 13, 1953.

For information apply to

Board of Examiners
228 N. LaSalle Street Chicago 1, Illinois

CLASSIFIED ADVERTISEMENT

WANTED—(a) CHIEF DIETITIAN; hospital group affiliated university medical school; duties include serving as consultant; $6000-$6500. (b) DIETITIAN to take charge dietary service, 60-bed student hospital; large university. (c) DIETITIAN; to take charge dietary department, voluntary general hospital, fairly large size; vicinity Chicago; slight preference for man; minimum, $5000. (d) CHIEF DIETITIAN; voluntary general hospital; average patient census 150; department well staffed; expansion program, California. (e) SUPERVISOR EMPLOYEES' CAFETERIA; general hospital currently under construction; residential town, East. (f) CHIEF DIETITIAN; voluntary general hospital, 250 beds; town 40,000 located in lake resort area, near university center; East; minimum, $5000. (g) Professionally trained EXECUTIVE HOUSEKEEPER; large teaching hospital; $4200, maintenance.

MEDICAL BUREAU
Burneice Larson, Director
Palmolive Building Chicago

COOPERATING HOTELS IN KANSAS CITY—All within easy reach of Municipal Auditorium

	Single	*Double*	*Twin*	*Suite*
Aladdin, 1213 Wyandotte	$4.00– 7.00	$6.00–10.00	$8.00–12.00	
Alcazar, 101 W. 39th	2.50– 3.50	3.00– 5.00		
Ambassador, 36th and Broadway	4.00– 6.00		4.50– 7.50	
Andrew Jackson, 12th and McGee	2.50	3.00	5.00	
Bellerive, 214 E. Armour	4.50– 7.00	7.00–10.00	8.00–11.00	$9.50 and up
Continental, 11th and Baltimore	4.50– 7.00	7.00– 9.00	8.00–12.00	15.00–25.00
Densmore, 912 Locust		3.50		
Dixon, 12th and Baltimore	4.00– 5.00	6.00– 7.00		
Fredric, 312 E. 9th	2.00– 2.50	3.50– 5.00	5.00– 6.00	
Kansas Citian, 1216 Broadway	3.50– 6.00	5.50– 8.50	6.00– 8.00	10.00–12.00
LaSalle, 922 Linwood		5.00– 6.00	6.00– 7.00	
Muehlebach, 12th and Baltimore	6.00–13.00	7.00–12.00	9.00–15.00	17.00 and up
New Yorker, 1114 Baltimore	5.00– 6.50	6.50– 8.50	8.50–11.00	
Phillips, 12th and Baltimore	5.00– 7.50	7.00– 9.50	8.50–10.50	17.00–25.00
Pickwick, 10th and McGee	4.50– 5.50	6.00– 8.00	6.50– 8.50	
President, 14th and Baltimore	5.00– 8.00	7.00–10.00	9.00–13.00	20.00–28.00
St. Regis, 1400 Linwood	3.00– 6.00	4.50– 7.50	5.50– 7.50	7.50–15.00
Senator, 17 W. 12th	3.00– 6.00		8.00–15.00	
Southland, 3517 Main		4.50– 5.00	5.00– 5.50	
State, 12th and Wyandotte	4.00– 6.00	6.25– 8.25	7.50– 9.00	
Street, 1510 E. 18th (for Negroes)	**	**	**	
Town House, Kansas City, Kansas	5.00– 9.00	7.50–10.00	8.50–14.00	
Victoria, 9th and McGee	2.50– 3.50	3.00– 4.00	5.00– 6.00	
Windsor, 3005 Main		3.00– 5.00		

**Rates on request.

See Hotel Reservation Form on Opposite Page

APPLICATION
FOR HOTEL ACCOMMODATIONS

44th ANNUAL MEETING

AMERICAN HOME ECONOMICS ASSOCIATION

Municipal Auditorium—Kansas City, Mo.

June 23-26, 1953

MAIL EARLY ***MAIL EARLY***

(LIST OF AVAILABLE HOTELS ON OPPOSITE PAGE)

Miss Mary Nugent
AHEA HOUSING BUREAU
1030 Baltimore Avenue, Third Floor,
Kansas City 6, Missouri

Please check if you are attending a pre-convention session ☐
Specify name of group
(HEIB or EXTENSION) .....

Please reserve hotel accommodations as follows:

1. **Preferred Hotels:**
   First Choice ..... Fourth Choice .....
   Second Choice ..... Fifth Choice .....
   Third Choice ..... Sixth Choice .....

2. **Please specify the number and types of rooms desired:** (Single, twin-bedded, suite, etc.)
   ..... Room(s) with bath for ..... person(s). Rate $ ..... to $ ..... per room.
   ..... Room(s) with bath for ..... person(s). Rate $ ..... to $ ..... per room.
   ..... Combination (2 rooms with one bath) for ..... persons. Rate $ ..... to $ ..... per room.
   ..... Room(s) and Parlor for ..... person(s). Rate $ .....
   ..... Room(s) without bath for ..... person(s). Rate $ ..... to $ ..... per room.

3. **Date of Arrival** ..... ; morning ..... or afternoon .....
   (Reservations will be held only until 6:00 p. m. unless the hotel is notified otherwise. If, after making reservations, you find it impossible to attend please notify the Housing Bureau promptly.)

4. **Date of Departure** ..... Approximate hour .....

5. **If accommodations are to be used by more than one person please list names below:**

NAME	STREET ADDRESS	CITY	STATE

Signed: .....

.....
(Street Address)

.....
(City and State)

6. **BE SURE TO SIGN YOUR NAME** ➡

RESERVATIONS WILL NOT BE ACCEPTED DIRECTLY BY THE HOTELS. When assignment has been made, confirmation of your reservation will be mailed to you directly by the hotel accepting your reservation.

Plan to share a room wherever possible. Single rooms are very scarce.

An efficient source of nutrients

ICE CREAM has five characteristics which star it as a food of high nutritional value: nutrient contribution . . . acceptability . . . completeness of digestion . . . efficiency of nutrient utilization . . . and adaptability to many types of diets.

Ice cream supplies energy, protein, calcium, riboflavin, vitamin A, and all other nutrients occurring in milk.[1]

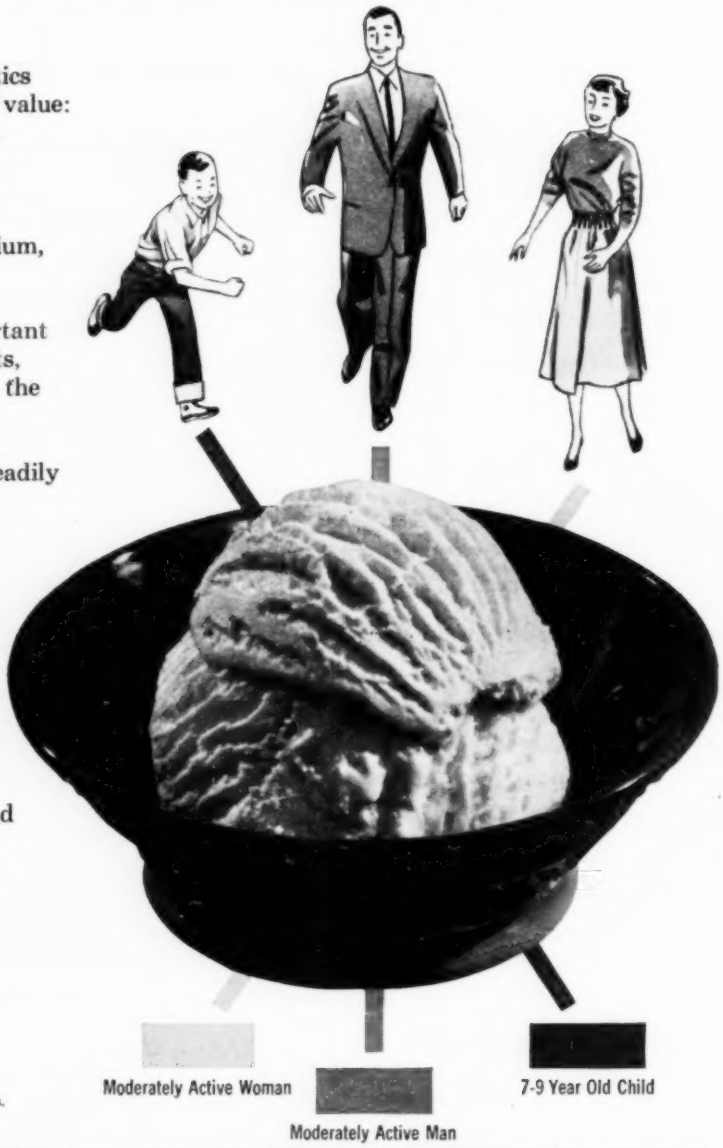
Ice cream is popular with all—an important nutritional fact. Regardless of its nutrients, a food has no value unless it is eaten, and the nutrients used by the body.

Laboratory studies show ice cream is completely digested . . . its nutrients are readily available to the body.[2,3]

The nutrients of ice cream are well utilized . . . milk protein, because of its desirable ratio of amino acids; the natural vitamin A, because it is preformed; the riboflavin, because it has been shown to be 100 per cent available to the body. No source of calcium is better utilized than that in milk.

Ice cream is valuable for everyday use by healthy people—and for therapeutic and convalescent diets, where energy value and body-building nutrients are needed in an easy-to-eat, readily digested form.

Ice cream is a good food, good for all.

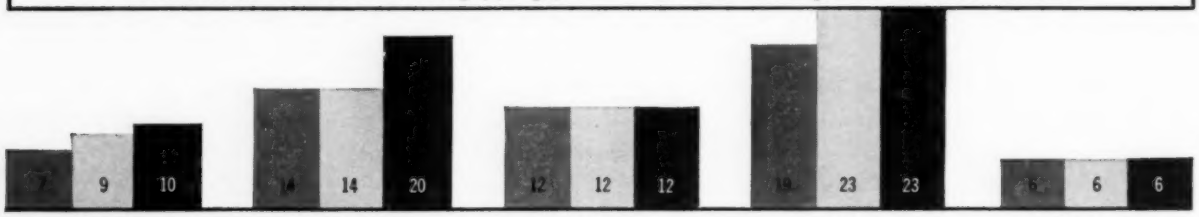


[1]Dahlberg, A. C. and Loosli, J. K. Nutritive value of commercial ice cream. J. Am. Diet. Assn. *24*:20 (Jan.) 1948.

[2]Everson, G., Pearson, E., and Matteson, R. Biological availability of certain foods as sources of riboflavin. J. Nutr. *46*:45 (Jan.) 1952.

[3]Everson, G., Wheeler, E., Walker, H., and Caulfield, W. J. Availability of riboflavin of ice cream, peas, and almonds, judged by urinary excretion of the vitamin by women subjects. J. Nutr. *35*:209 (Feb.) 1948.

Percent contribution of one serving (1/6 qt.) vanilla ice cream to daily needs for some nutrients.



This seal indicates that all nutrition statements in the advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

NATIONAL DAIRY COUNCIL

111 NORTH CANAL STREET • CHICAGO 6, ILLINOIS

Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and education to extend the use of dairy products.

Food habits have changed . . . *but plenty!*

. . . of course, it's electric!

1953 WESTINGHOUSE FREEZER-REFRIGERATOR IS GEARED TO NEW FOOD-KEEPING NEEDS

"Compared to the period before World War II, the people of the United States are eating 19% *more* meat, 42% *more* eggs, 11% *more* fruits and vegetables, and 20% *more* dairy products, except butter . . . but 24% *less* potatoes and 17% *less* grain products," a 1952 statement from the Department of Agriculture points out.

Notice that all of the foods now being used in greater quantity than before World War II require careful refrigeration . . . making it even more essential that your home economics laboratory be equipped to demonstrate proper storage of perishable foods.

The new 11.4 cubic foot Westinghouse Freezer-Refrigerator provides safe storage for today's greater quantity and variety of perishable foods . . . plenty of space, recommended temperatures and specially designed places for various foods. The Food Freezer holds 77 lbs. of frozen foods in safe zero cold. The 9 cubic foot refrigerator compartment safeguards foods in below 40° cold . . . includes a Meat Keeper that holds 18 lbs. of fresh meats at approximately 34°, and two Humidrawers that store ¾ bushel of fresh fruits and vegetables in mild, moist cold.

This new Two-Door Model also has all of the convenience features which are so important in teaching modern homemaking . . . roll-out shelves, adjustable shelves, shelves in the doors, a Butter Keeper and Frost-Free® Automatic Defrosting. And there are seven other 1953 Westinghouse Refrigerators to choose from . . . all new!

TEACHING AIDS KIT . . . FREE!

Save all kinds of planning time with this kit of 22 aids for home economics classes. *Electric Household Refrigeration* is one of 4 Appliance Reference Handbooks included. There are also Home Freezing Guides, Student Fact Folders, an important report on family nutrition and booklets covering all phases of electrical living. Write Westinghouse Electric Corporation, Consumer Service Dept., 3JR-3, 250 East Fourth Street, Mansfield, Ohio.

WESTINGHOUSE SCHOOL PLAN

Schools buy the latest appliances at special low prices . . . and get new models yearly at no extra cost. Contact your Westinghouse Distributor or Dealer for details.

YOU CAN BE SURE..IF IT'S Westinghouse

SCHOOL PLAN APPLIANCES: Refrigerators, Home Freezers, Ranges, Laundromat®, Clothes Dryers, Waste-Away®, Dishwashers, Water Heaters, Roaster-Oven and Food Mixer.

PRESS OF
JUDD & DETWEILER, INC.
WASHINGTON, D. C.

"Let ME TELL YOU ABOUT KELVINATOR'S NEWLY-DESIGNED LINE OF ELECTRIC RANGES!"

says Joan Adams
of KELVINATOR KITCHEN
Editor, Kitchen Reporter

"You've never seen anything so beautiful, so easy to keep clean, so perfectly designed for good cooking results. Here is equipment with which even beginners can know the real joy of cooking. For every feature on these new Kelvinators is designed to make good cooks better.

"At the left is Kelvinator's new 'Automatic Cook' model with new 'Picto-Heat' controls that indicate in colored lights whether inner or outer heating elements of the surface units are on. Two giant ovens, super-speed surface units, a broiler that gets red hot in 10 seconds, oven that pre-heats to 350° in less than five minutes, 7 measured heats on each surface unit are advantages that mean de luxe cooking, precision cooking, whether in the classroom or the home."

"At the right is the sensational Kelvinator 30-inch range with 'Great Scot' oven—'a whole roast wider than most'. Here's big range cooking in a range no wider than a card table. Here, also, is automatic cooking, 7-heat surface units —high-speed broiler—all at a moderate price. Your Kelvinator dealer will be glad to show you the full line. Ask him, too, about his liberal School Appliance Installation Plan."

Joan Adams

"P. S. We have a wonderful new colored sound film, 'Just Like Magic', that shows all of the advantages of electric cooking. Write me to arrange for showing this interesting and entertaining film to your classes."

IT'S TIME TO GET **Kelvinator**

Kelvinator, Division of Nash-Kelvinator Corporation, Detroit 32, Mich.